VOLUME 38
NUMBER 7

CONVENTION ISSUE

JULY, 1951

plating

POSTMASTER: IF UNDELIVERABLE RETURN TO
5800 N. MARVINE ST., PHILADELPHIA 41, PA.
RETURN POSTAGE GUARANTEED

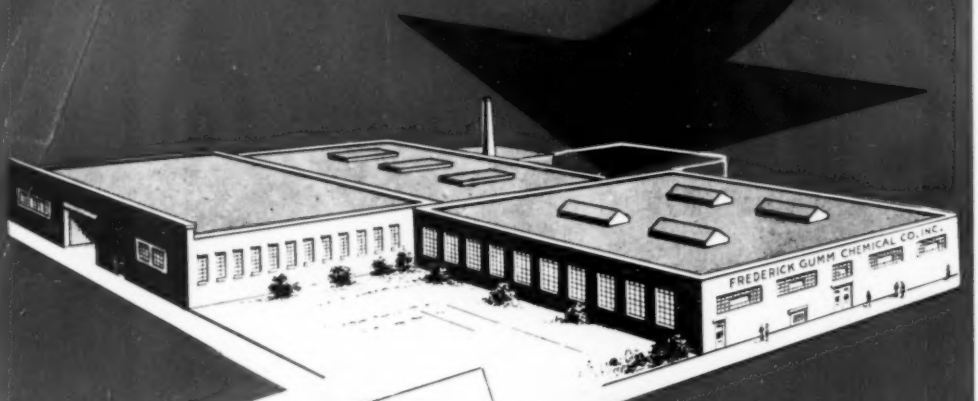
University Microfilms
313 N. First St.
Ann Arbor, Michigan

BUFFALO BECKONS
JULY 30—AUGUST 2

See Contents Page 693

FURTHER EXPANSION TO HELP YOU MEET TODAY'S STEPPED-UP SCHEDULES!

You can depend on FREDERICK GUMM CHEMICAL COMPANY, INC., with their enlarged plant, to help you schedule your government orders for peak production efficiency.



Welcome to the
American Electroplaters' Society
38th Convention
Buffalo, New York
July 30-31 August 1-2, 1951

CLEANING COMPOUNDS

FREDERICK **GUMM** *Chemical Company Inc.*

538 FOREST STREET, KEARNY, N. J.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 510.

Enthone metal strippers

no attack on the base metal

strip in barrels baskets or bulk... without electric current

metal stripper A

A new alkaline compound that chemically dissolves nickel, copper, zinc, cadmium and silver from steel without etching or attack. The steel is clean and ready for refinishing. Suitable for rack, basket or barrel stripping. Removes excess silver solder from steel rapidly. Patents pending.

metal stripper N-165S

A compound added to acid solutions to promote rapid stripping of nickel, tin and lead coatings from copper alloys. No electric current is required.

WRITE FOR LIST OF SIXTY PRODUCTS AND PROCEDURES FOR METAL FINISHING

ENTHONE

442 ELM STREET • NEW HAVEN, CONN.

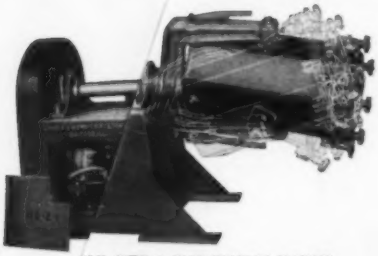
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 541.

USE "RELIANCE" PRODUCTS FOR

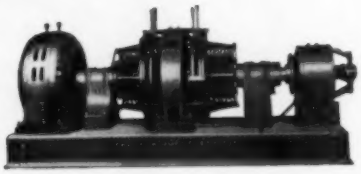
ECONOMY : EFFICIENCY : DEPENDABILITY

LET US SUPPLY YOUR NEEDS FOR YOUR PLATING OR POLISHING DEPARTMENT

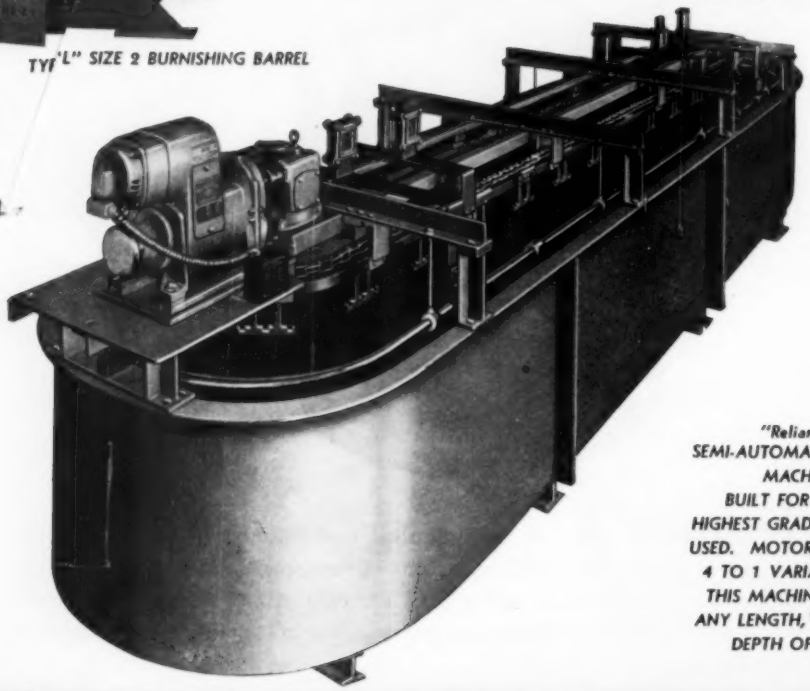
WRITE FOR FURTHER DETAILS



TYPE "L" SIZE 2 BURNISHING BARREL



3000 AMP. 6 VOLT GENERATOR SET



"Reliance"
SEMI-AUTOMATIC PLATING MACHINE
BUILT FOR SERVICE
HIGHEST GRADE MATERIAL USED. MOTOR ¾ to 1 HP
4 TO 1 VARIABLE SPEED.
THIS MACHINE IS BUILT ANY LENGTH, WIDTH AND DEPTH OF TANK.

Chas. F. L'Hommedieu & Sons Co.

MANUFACTURERS of

Plating and Polishing Machinery

Complete Plating Plants Installed

C. B. Little
Newark, N. J.

W. R. Shields
Detroit, Mich.

O. M. Shoe
Philadelphia, Pa.

Gen. Office and Factory:
1321 Ogden Ave.

CHICAGO

Branches:
Cleveland
and
Los Angeles

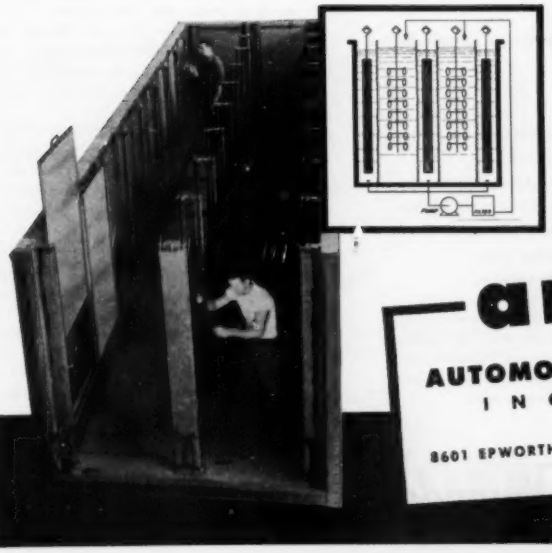
AT THE . . .

NATIONAL AES CONVENTION IN BUFFALO

the accent will be on...

"Diaphragming"

...answer to a critical problem in bright copper and nickel plating



Our engineers have led the industry in making the Diaphragming principle practical and available.

'Phone or write for consultation.

A comprehensive discussion of Diaphragming is available in booklet form. Let us send you your copy.

arco

AUTOMOTIVE RUBBER COMPANY
INCORPORATED

8601 EPWORTH BOULEVARD • DETROIT 4, MICHIGAN

REMOVE / SCALE OXIDES FLUX

new-improved

Faster, easier with WYANDOTTE A.E.

WYANDOTTE A.E. IS A PICKLING AGENT that, in general, can effectively and advantageously replace hydrochloric and sulfuric acids. Because it's a mixture of powdered acid salts, the new, improved A.E. is easy to control. And the difference in results? A.E. contains synthetic wetting agents that "wet out" and rinse fast, leaving surfaces clean and really bright!

Ask your Wyandotte Representative to show you how easy the new A.E. is to use, how it does a much better job for you.

P.S. If you have a cleaning problem of any sort, write Wyandotte for free technical help.

Wyandotte A.E. is a pickling agent that's balanced to give a wide range of applications. Users report superior results of A.E. over previous methods in the following applications:

On zinc base die castings following electrocleaning and prior to plating

On brass following electrocleaning and prior to plating

For removing heat treat scale from ferrous parts in tumble barrels

For removing heavy tarnish from brass

For removing dirt, scale, oxide from automobile radiators

For removing scale and rust from steel after electrocleaning and prior to electroplating

For removing rust and spot weld marks from parts in tumble barrel applications, prior to barrel plating

For removing flux after brazing operations

NEW

WYANDOTTE A.E.

Wets out and rinses fast
Gives a bright finish
Is very easy to handle—not dusty
Eliminates water or acid spotting
Does not give off obnoxious fumes
Has long solution life
Less critical to control

"Cleaning the World"

THE WYANDOTTE LINE—products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.

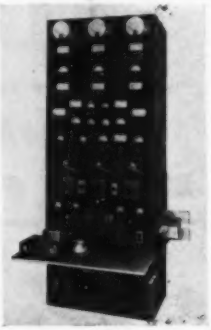
WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN

Service Representatives in 88 Cities

Wyandotte
REG. U. S. PAT. OFF.

Industry News

Rapid Electric Installs Test Equipment. Rapid Electric Company, 2881 Middletown Road, New York 61, N. Y., has installed an elaborate test stand for rectifiers. Designed by the Rapid Electric Engineering staff, this new equipment can check virtually every detail of the construction and operation of rectifiers up to 5,000 amperes capacity, including such factors as efficiency over entire operating range; current and voltage overload endurance tests; temperature surveys under full load; voltage regulation; cooling-air displacement; phase balance; output wave form; ripple voltage; operation of protective devices; meter calibrations. A record of the results of this final test inspection accompanies each unit.



Electrochemical Society Honors National Bureau of Standards. At its 99th convention in Washington, D. C., on April 8–12, the Electrochemical Society honored the National Bureau of Standards at its 50th anniversary. A scroll was presented by the Society's president, Dr. Charles L. Faust, to Dr. E. U. Condon, N.B.S. Director.

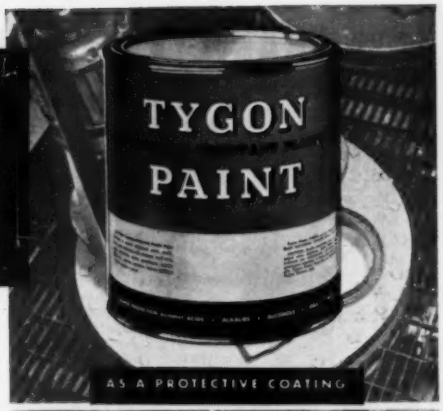
An audience of 600 scientists and technologists heard 120 papers in the fields of electronics, luminescense, rare metals, electrothermics, theoretical electrochemistry, and industrial electrical insulation. Dr. William Blum, Chief of the N.B.S. Electrodeposition Section, served as the Honorary Chairman, and Paul L. Howard, of the Bureau's Electrochemistry Section, was General Chairman.

The Faraday Society of England was officially represented at the meeting by Dr. J. O'M. Bockris of the Imperial College of Science and Technology. Dr. Bockris received the Richard's Memorial Award, which is presented by the

Published monthly at 5800 N. Marvine St., Philadelphia 41, Pa. Entered as second class matter July 1, 1946, at the Post Office at Philadelphia, Pa., under Act of August 24, 1916. Subscriptions: Domestic and Canada, $4.00 for 1 year, $7.00 for 2 years 50c per copy; Foreign, $8.00 per year, $1.00 per copy.

Let TYGON PLASTIC

provide the answer to your TOUGH CORROSION PROBLEMS



AS A PROTECTIVE COATING

Tygon Plastics are resistant to an unusually wide range of corrosives, much more so than rubber or metals. Many formulations are completely non-toxic, may be used safely in contact with foods, drugs or solutions which must be kept free from metal or sulphur pick-up.

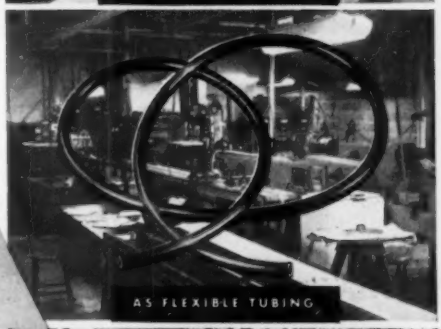
Tygon's physical properties are interesting, too. Tygon, in liquid form, can be applied like a paint to metal or concrete; dries to a tough, elastic film that shrugs off corrosive fumes or acid spillage. Solves the problem of protecting structural steel, tanks and other exterior surfaces.

Tygon sheet stocks, 3/32" thick, serve as an effective long-lived lining for tanks, ducts, pipe and other process equipment, particularly for handling strong oxidizing agents such as nitric, chromic, strong concentrations of sulphuric acids, and bleaches.

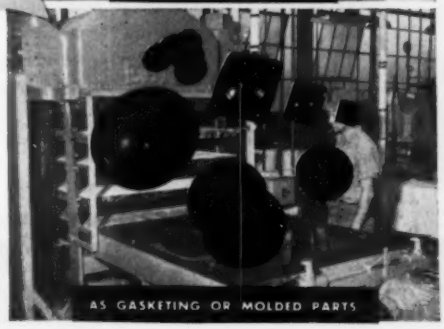
AS A LINING MATERIAL

Tygon cut, molded, and extruded gaskets further extend the range of usefulness of this versatile material.

Tygon flexible plastic Tubing offers a better, simpler way to pipe many corrosive solutions, and gases, as well as liquid foods, and beverages. Available in bores from .120" up to 2", Tygon Tubing may be clear or opaque, as well as outer-braid reinforced for high pressures.


AS FLEXIBLE TUBING

TYGON
THE VERSATILE CORROSION-RESISTANT
PLASTIC


AS GASKETING OR MOLDED PARTS

It's worth checking into — one of the many Tygon flexible plastic formulations may well provide the answer to your tough corrosive problems.

U. S. STONEWARE

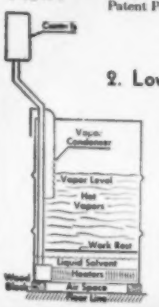
PLASTICS AND SYNTHETICS DIVISION — AKRON 9, OHIO

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 545.

Brand New!

BAR-L Vapor DEGREASER

Patent Pending

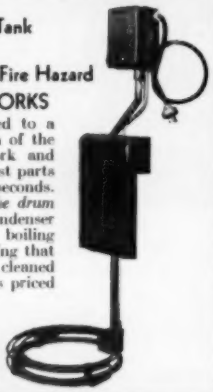


Use Your Solvent Drum for a Tank

1. Efficient Cleaning
2. Low Investment
3. No Fire Hazard

HOW A DEGREASER WORKS

Trichlorethylene solvent is heated to a boiling point in the lower section of the drum. Vapors condense on work and wash off oil, grease and dirt. Most parts can be cleaned in less than 60 seconds. Solvent vapors are kept *inside the drum* by a scientifically-designed condenser which returns the solvent to the boiling chamber. REMEMBER: Anything that can fit into a solvent drum can be cleaned in a BAR-L Degreaser! And it's priced right! *Write for complete details.*



Manufacturers Processing Co.

METAL CLEANING CHEMICALS AND EQUIPMENT

P. O. BOX 6 • DETROIT 20, MICHIGAN

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 546.

Our illustration shows a corner of the extensive pilot plating plant at Westinghouse's East Pittsburgh laboratories where many improved plating processes have been developed and tested.

For example, this line of 100 gallon tanks was used to perfect the company's P.R.* process of plating to secure brighter finishes by periodic reversal of the plating current.

Five Sarco Type LSI indicating electric controls actuating solenoid valves to maintain any desired constant plating temperature on 100 gallon tanks of PR process pilot line at East Pittsburgh.

Sarco Type LSI indicating electric temperature control for all kinds of plating. Long or short temperature ranges custom made as needed. Bulletin 1027.

New: Sarcostat hydroelectric motor valve for use with LSI thermostats in place of solenoid valves. Powerful, direct thrust—no pilots or levers, slow opening and closing. Bulletin 1082.

SARCO PLATING CONTROLS

Sarco Plating Controls were selected as a result of several years' experience in Westinghouse plants in Pittsburgh and elsewhere.

You can buy them with confidence. Low first cost, high accuracy, long life with minimum maintenance cost are outstanding features. Write for our Bulletins and the name of the Sarco man nearest you. His experience may include the solution to some of your control problems.

*For full information on this process see the article in the May 1st, 1950, issue of "Steel".

701

SARCO COMPANY, INC.

Represented in Principal Cities

Empire State Building, New York 1, N. Y.

SARCO CANADA, LTD., TORONTO 5, ONTARIO

628 FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 547.

Industry News

Electrochemical Society for notable contributions to the science of electrochemistry. His Richard's Memorial Lecture was about "Hydrogen Overvoltage".

Following the presidential banquet, the Young Author's Prize was awarded to George W. Murphy, University of Wisconsin, and the Turner Book Prize to Paul Delahay, Louisiana State University. Dr. Faust delivered the presidential address as the retiring president. Dr. R. M. Hunter, Dow Chemical Company, was installed as President and Marvin G. Udy as the newly elected Third Vice-President.

Murray-Way Occupies New Plant. The Murray-Way Corporation personnel and clients formally celebrated the occupancy of the Corporation's new plant and offices, located on Maple Road, east of Birmingham, Mich., with an open house, Saturday, May 19. This marks the third expansion since the firm was founded by its President, Ernest E. Murray, in 1940.

The new building affords approximately three times the floor area of the former Detroit location, and plans have been made for still further expansion, as needed, on the company's five-acre property. In the new quarters, Murray-Way will greatly increase the production of its well-known automatic Micro-Polish units for polishing flat metal sheets, rolls or blanks before forming and of its line of standard-design polishing and buffing heads and automatic conveyors.

The company has also opened a new department to handle contract polishing of sheet, blanked or coiled stock for manufacturing companies.

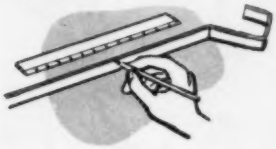
The corporation officers are Ernest E. Murray, President; Donald M. Teer, Vice-President; Roman J. Zech, Secretary; and Robert J. Gilmore, Treasurer.

A. S. T. M. Committee B-8 on Electrodeposited Metallic Coatings. One of the primary activities of this committee during the past several years has been the development of numerous specifications and recommended practices for plating various materials. The committee will present to the Society in June recommended practices for plating on zinc-base diecastings, aluminum, and stainless steel. Subcommittee IV, which developed these recommended practices, is also making progress on specifications for plating on copper and copper alloys and on plastics. It is also surveying the need for recom-

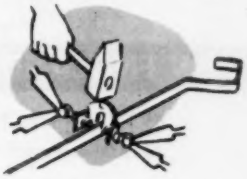
DRIVE-ON SADDLE TIPS ARE Terrific!

WOW!

all you have to do is:



1 Measure and mark Spline

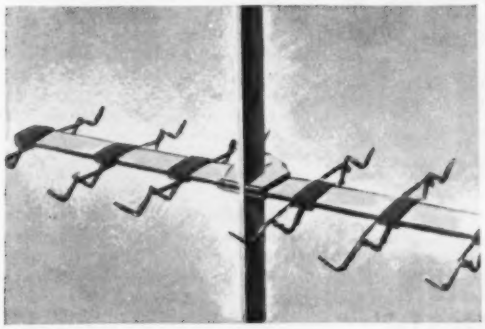


2 Drive-on STANDARD Saddle Tips *

*Patent applied for.

Eliminates expensive shop time used to bore and adjust splines

SAVES TIME...SAVES MONEY...HOLDS FIRM

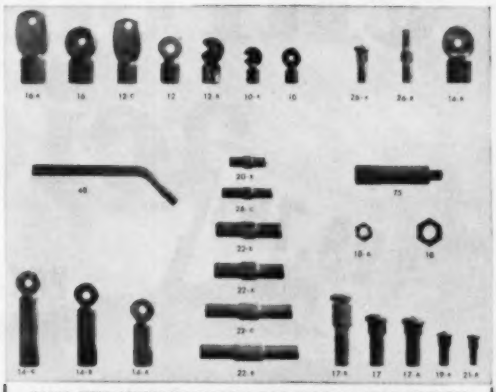


Rides the Spline like a Cowboy

Standard Plating Rack Company

1913-25 N. PAULINA STREET, CHICAGO 22, ILL.
Phone: ARmitage 6-6766

The most modern and efficient rack producing plant in the world
WE CAN FURNISH PARTS FOR YOUR ASSEMBLY OUT OF STOCK



MAIL THE HANDY COUPON FOR MORE INFORMATION

STANDARD PLATING RACK CO. *P
1913-25 N. Paulina Street, Chicago 22, Illinois

Gentlemen: Yes, I am interested in STANDARD SADDLE TIPS. Please have your sales representative call, with a sample of this new—easy-to-use drive on Saddle Tip at no obligation to me.

Name .....
Company ..... Position .....
Address .....
City ..... State .....

NEBCO

BUFFING AND POLISHING WHEELS

Our Best "Ad"

NEBCO's best advertisement for its buffing and polishing wheels has always been *satisfied customers* . . . because they recognize and appreciate top quality, complete honesty and dependable performance in a product they use.

NEW ENGLAND BUFF COMPANY

493 C Street, Boston 10, Massachusetts

7338 Woodward Avenue, Detroit 2, Michigan

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 549.

chromic acid

99.75% PURE

POTASSIUM BICHROMATE

SODIUM BICHROMATE

MUTUAL CHEMICAL CO. OF AMERICA — MUTUAL — NEW YORK N.Y.A.

SINCE 1845

REG U.S. PAT. OFF.

MUTUAL CHEMICAL COMPANY OF AMERICA

270 Madison Avenue, New York 16, N. Y.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 550.

Industry News

mended practices for plating on lead and lead alloys and on malleable and cast iron.

Specifications B 201–49T for Chromate Finishes on Electrodeposited Zinc, Hot-Dipped Galvanized, and Zinc Die-Cast Surfaces and A 219–45T on Local Thickness of Electrodeposited Coatings are to be continued as tentative in view of the work going on in various subcommittees.

One of the projects under consideration in the committee is the use of metric system equivalents in addition to English units in all specifications under its jurisdiction.

Subcommittee V on Supplementary Treatments is currently preparing zinc-plated test panels which will be given treatments and exposed to the atmosphere. The group is also investigating the use of various chromate treatments on cadmium-plated specimens.

Mr. C. H. Sample, The International Nickel Company, is the Chairman; Dr. R. B. Saltonstall, The Udylite Corporation, the Secretary of the Committee.

The Atlas Mineral Products Company has announced further expansion of its Houston, Texas, plant. The new construction will include a modern lining shop and storage facilities. All types of linings will be installed.

School Comes to the Plating Plant. Because of today's need for improved production and lessened wastage, particularly in plating plants operating under defense contracts, Joseph B. Kushner, Electroplating Engineer, has announced the inauguration of a new service.

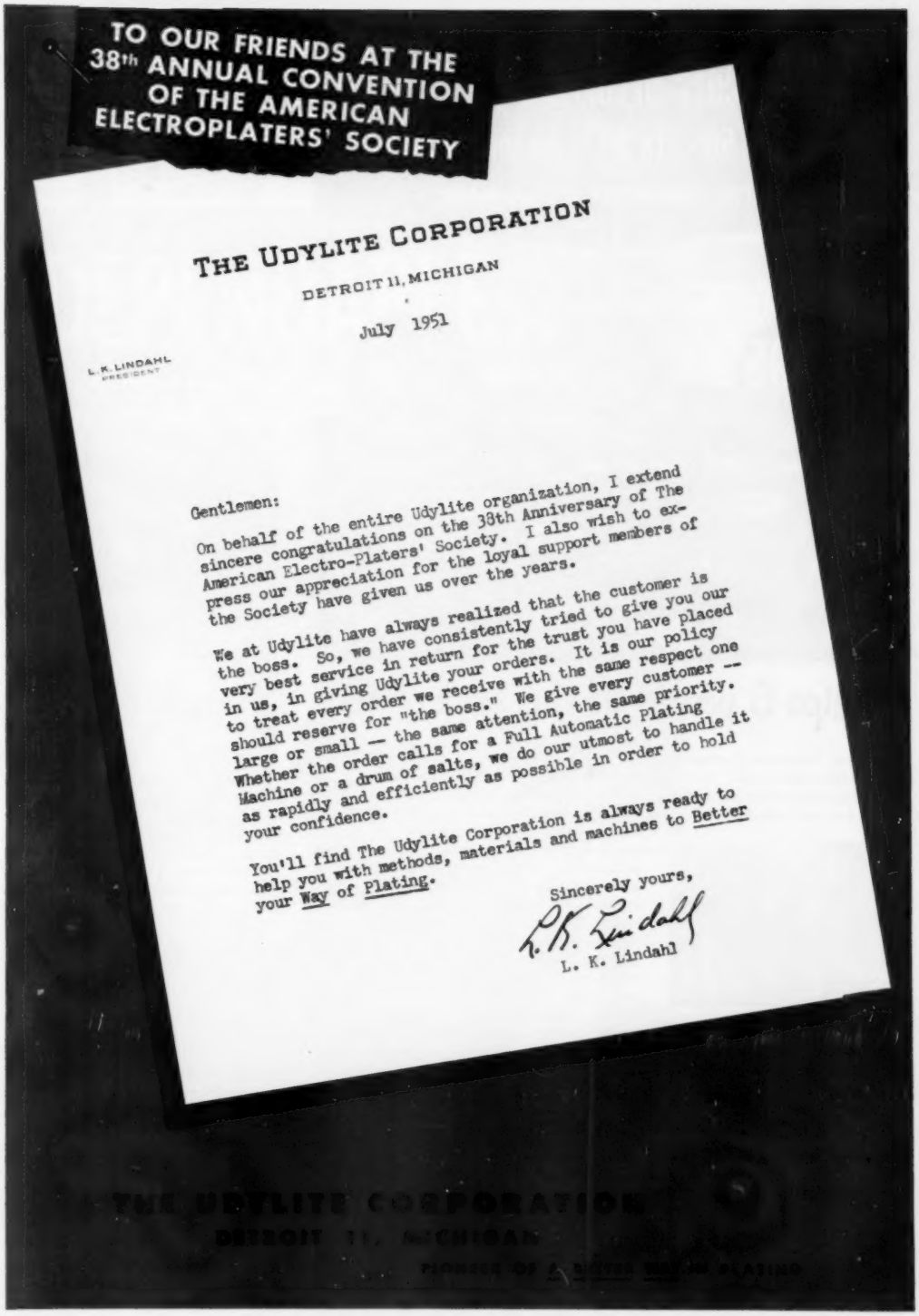
The service consists of a school for the manufacturers' plating personnel, "Right at the Plant", in which they are taught the principles behind the work they are doing, and improved practical methods for doing that work so that they can perform their jobs more efficiently and with greater teamwork and thus improve production.

Two instruction courses are available on the plant premises, each one personally conducted by Mr. Kushner. The first is an intensive one-week course in the Principles of Electroplating. The second course, also given in the period of a week, deals specifically with the plating operations conducted in the plant where the

CHEMIST WANTED

Established Detroit manufacturer has opening for a chemist experienced in the development of metal cleaners and strippers or drawing compounds. All replies confidential. Our employees know of this ad. *Reply to:*

P-751-A, PLATING
P. O. Box 168, Jenkintown, Pa.


TO OUR FRIENDS AT THE
38th ANNUAL CONVENTION
OF THE AMERICAN
ELECTROPLATERS' SOCIETY
THE UDYLITE CORPORATION
DETROIT 11, MICHIGAN
July 1951
L. K. LINDAHL
PRESIDENT
Gentlemen:
On behalf of the entire Udylite organization, I extend sincere congratulations on the 38th Anniversary of The American Electro-Platers' Society. I also wish to express our appreciation for the loyal support members of the Society have given us over the years.
We at Udylite have always realized that the customer is the boss. So, we have consistently tried to give you our very best service in return for the trust you have placed in us, in giving Udylite your orders. It is our policy to treat every order we receive with the same respect one should reserve for "the boss." We give every customer -- large or small — the same attention, the same priority. Whether the order calls for a Full Automatic Plating Machine or a drum of salts, we do our utmost to handle it as rapidly and efficiently as possible in order to hold your confidence.
You'll find The Udylite Corporation is always ready to help you with methods, materials and machines to Better your Way of Plating.
Sincerely yours,
L. K. Lindahl
THE UDYLITE CORPORATION
DETROIT 11, MICHIGAN

ROTO FINISH

CUTS DEBURRING COSTS
50% to 90% on individual parts
at the WHIRLPOOL CORPORATION, St. Joseph, Michigan

...saves...

$0.395 per hundred
BRASS RETAINING RINGS
AFTER
BEFORE

$0.23 per hundred
CRANK ASSEMBLY PARTS
AFTER
BEFORE

$1.60 per hundred
CAM BARS
BEFORE
AFTER

helps 6 people do the work of 16

The Whirlpool Corporation found a real solution to manpower scarcities and rising prices when they installed Roto-Finish Deburring Machines. By this mechanical method, 6 people now deburr an even greater quantity of parts than 16 could do before. Thus a much needed source of manpower was found for use in other operations.

The cost of deburring individual parts has been reduced 50% to 90% as shown above. And in addition, parts can now be deburred economically that were impossible to do by hand methods because the cost was prohibitive. Roto-Finishing these parts in some cases has eliminated special handling in subsequent operations. As a result, production has been speeded and manhours have been saved in stamping, grinding and other finishing operations.

Let us show you how you can make similar savings in time, manhours and money. Send sample parts to the Roto-Finish laboratory for a free demonstration. Write for full details today.

Roto-Finish COMPANY
associated with The Sturgis Products Co.
3703 MILHAM ROAD KALAMAZOO, MICHIGAN

FOREIGN REPRESENTATIVES: CANADA — Windsor — Roto-Finish Canada Limited • ENGLAND — London — Roto-Finish Limited — 39 Park Street — Mayfair • AUSTRALIA — Melbourne — A. Flavell Pty. Ltd. • HOLLAND — Delft — N. V. Roto-Finish Maatschappij — Rotterdamse — WEG 370A • GERMANY — Frankfurt a.M. — Metallgesellschaft A.G. • ITALY — Milan — Societa Roto-Finish a R.L. — Sesto S. Giovanni — Viale E. Marelli, 31 • FRANCE — Paris — Societe Roto-Finish, 70 rue de la Republique-Puteaux (Seine) • SWITZERLAND — Zurich — Kay-Zurich — Lowenstrasse 1 • BRAZIL — Rio de Janeiro — Commercial E. Industrial de Formas Watch, Ltda.

ORIGINATORS OF THE ROTO-FINISH PROCESSES

Industry News

course is being given. All text material is supplied by the School and will be retained by the plant personnel for study and reference. As far as possible, the class training periods will be chosen so that they do not interfere with plant production.

Manufacturers who desire to improve their plating results are invited to write to Joseph B. Kushner, Electroplating Engineer, Director, Joseph B. Kushner Electroplating School, Stroudsburg 18, Pa.

Battelle Memorial Institute, Columbus, Ohio, has begun construction of the new million-dollar laboratory building sketched here. The new laboratory, which results from increased demands for research services in behalf of the nation's

defense effort, will be Battelle's fifth in the past decade. A three-story structure with two bays for pilot plant operations, it will provide approximately 80,000 square feet of work area and will house 115 unit laboratories. Currently, Battelle's research volume surpasses $8,000,000 annually.

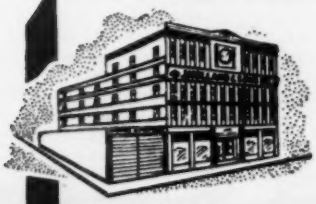
General Electric Science Research Fellowships amounting to $17,200 have been awarded to 12 of the nation's most promising graduate students, A. D. Marshall, Assistant Secretary of the General Electric Company and Secretary of the million-dollar G-E educational fund, has announced.

Seven of the students received Charles A. Coffin Fellowships for advanced study in electricity, physics, and the physical sciences. Since the establishment of the fellowships in 1923 to honor Charles A. Coffin, one of the founders and the first president of General Electric, 197 such grants have been awarded. The remaining five students were awarded Gerard

WANTED

Manufacturer's Agents in certain areas to sell McKEON'S "ZINC BRITE," world's most effective cleansing and purifying agent for cyanide zinc plating solutions. Liberal commission. Excellent cooperation. *Write:*

SULPHUR PRODUCTS CO.
Greensburg 8, Pa.



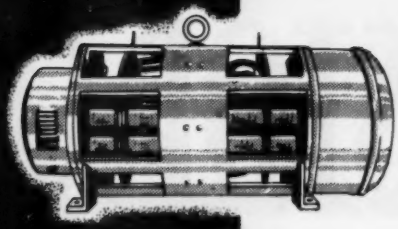
J. HOLLAND & SONS, INC.

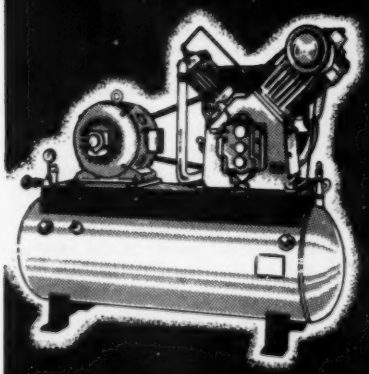
276 SOUTH NINTH STREET • BROOKLYN 11, N. Y.

DEPENDABLE...

ELECTROPLATING AND FINISHING EQUIPMENT AND SUPPLIES

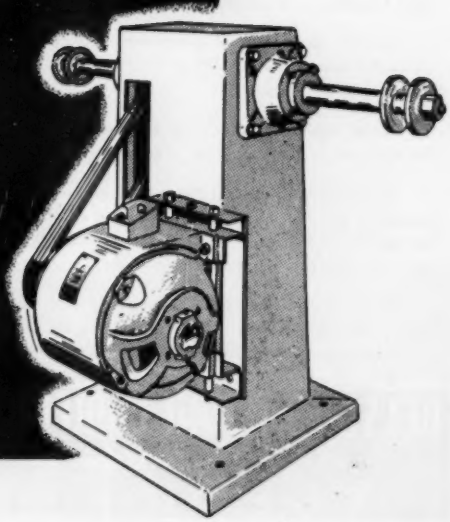
Motor Generator Sets, Plating Rheostats, Tanks for all purposes, Plating Barrels, Agitators, and practically everything for the Plating Department.





Air Compressor Units, Baking Ovens, Spray Booths, Fans, Transformers, Regulators, Pressure Tanks, and practically everything for the Spray Department.

Motor Driven Buffing Lathes, Hoods, Blowers, Ducts, Blower Systems, Floor Lathes, Scratch Brush Units and practically everything for the Buffing Department.



Industry News

Swope Fellowships for advanced study in industrial management, engineering, the physical sciences, and various scientific and industrial fields. A total of 42 Swope fellowships have been awarded since 1945, when the awards were established in honor of the third president of the company.

Sulfuric Acid Shortage. The U. S. last year produced 5,350,000 long tons of sulfur to furnish about half the world's supply. Although this production is about 2½ times prewar levels, the supply is expected to fall short of demand this year by approximately 1,000,000 tons.

U. S. sulfur-producing companies several years ago saw that a shortage was inevitable and took steps to find and develop new sources of supply. The first industry project is the multimillion-dollar amphibious operation of Freeport Sulphur Company to mine sulfur beneath Bay Ste. Elaine in the Louisiana Bayou country, but it is not expected to be in operation before the end of 1952. It is one of three new sulfur domes being developed in this country, which, at full operation, are expected to produce about 530,000 tons annually.

There are ample reserves of sulfur in other forms, such as pyrites and gypsum, but recovery of sulfur from them is a marginal operation at present sulfur prices.

"Grits That Grind", a new Norton Company color motion picture on abrasives and grinding wheel manufacture, is now ready for showing. It is a 30-minute, 16-mm film showing step by step manufacturing processes from mining bauxite in Arkansas to the finished product in Worcester: Alundum (aluminum oxide) and Crystolon (silicon carbide) grinding wheels. The film also touches on other Norton products such as grinding machines, sandpaper, sharpening stones, porous media, non-slip floors and tile, and wear-resistant products.

This new film is now available free of charge on loan by writing to "Grits That Grind", Norton Company, Worcester 6, Mass. Copies may also be purchased.

Platers Meet With N.P.A. A meeting was held by the National Association of Metal Finishers with representatives of the N.P.A. in Washington, D. C., on April 19. Those present from the Association were J. Robert Greenwell, Chicago, Ill.; Robert J. Huber, Detroit, Mich.; Henry J. Bock, Detroit, Mich.; E. J. Musick, St. Louis, Mo.; Leonard E. Weeg, Rockford, Ill.; W. O. Zinn, Chicago; John Palik, Cleveland, Ohio; H. C. Simmons, Atlanta, Ga.; Adolph Bregman, Executive Secretary, New York Association, New York, N. Y.; Raymond M. Shock, Executive Secretary, N.A.M.F., Detroit, Mich.

The following government representatives from the Industry Operations Bureau of the N.P.A. were present: Frank H. Hayes, Director, Copper Division; David Duff, Nickel Section, Iron and Steel Division; John N. Ludwig, Jr., Ferro-Alloys Section, Chrome, Lead and Steel Division; Frederick Arden, Chemical Division.

Mr. Shock opened the meeting by reporting that a number of plating suppliers had suggested the conversion of present nickel installations to copper in order to produce the copper-chromium plate which is permissible under the copper order. Upon investigation, however, it was found that copper was not available. Mr. Hayes explained that it is in very short supply and will continue so throughout this year in spite of the fact that production and imports are at their maximum. Some improvement may result from the new Controlled Materials Plan.

Mr. Duff discussed nickel, which is in the tightest position of any of the platers' materials. He explained that the demands of the Munitions Board for the Armed Services had been so huge as to make the present and prospective supplies of nickel totally inadequate to take care of them in full, let alone civilian requirements. The ultimate authority in the distribution of nickel, as in other critical materials, is the Munitions Board.

STOP OFF

NEW MASK TYPE CAN BE USED OVER AND OVER

A new material and a new process for selective plating in Copper, hard Chrome, or in the anodizing of Aluminum.

Simple, quick action semi-permanent masks which can be used repeatedly, with a life of 100 to 500 cycles depending on kind of plating and care in handling.

Great savings in time, labor and cost. Just place the mask in position on the work, secure, and run. Then remove and place on the next piece.

BUNATOL Stop Off Masks are made to fit the job, of flexible and extremely tough material. Will withstand all plating solutions and cleaners, but not the degreaser. In most cases the mask can be removed and placed on the next piece in a matter of minutes.

If you are interested send us sample part with the stopped off areas plainly marked. We will quote on making the mask if the part lends itself to this process. No obligation and parts will be returned promptly.

NELSON J. QUINN COMPANY TOLEDO 7, OHIO

— for 15 years —

Rack Insulation Exclusively

SITUATION WANTED

Foreman Plater, chemist, thirty years' experience on silver, bright nickel and chrome on nickel silver and carbon steel flatware and cutlery and electropolishing on stainless steel. Best references. *Reply to:*

P-751-B, PLATING
P. O. Box 168, Jenkintown, Pa.

THIS MAN'S POLISHING IS DONE

• EASIER • QUICKER • BETTER

with

EXOLON

● Whether it's original equipment or a replating job on an automobile bumper, the polishing is performed efficiently and economically with tough, durable EXOLON aluminum oxide abrasives. Carefully graded, chunky-shaped grains of EXOLON are treated to provide high capillarity for a better bond on the set-up wheel.

A high finish was obtained on the Buick bumper (illustrated) by first using 150 and then 220 grade RHT EXOLON. When it's EXOLON . . . you can count on smoother surfaces.

WRITE TODAY for the COMPLETE EXOLON STORY

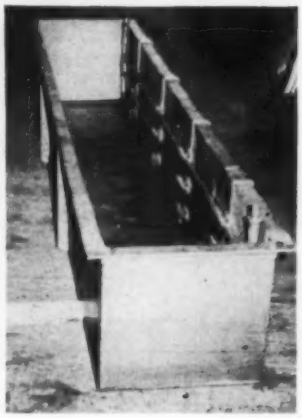
The EXOLON Company

973 EAST NIAGARA STREET TONAWANDA, NEW YORK

MANUFACTURERS OF SILICON CARBIDE AND ALUMINUM OXIDE ABRASIVES

Superior Fabrication Procedures

assure long life for lead linings



ECONOMY of long life is made certain by adherence to the Storts specification for lead welding. Three or more layers of weld metal on the joints and seams, according to the thickness of the lining, build up the full strength of the metal—and more—over an area of three to four times that of the lining thickness. Storts welds them for keeps.

42 STONE STREET — STORTS WELDING COMPANY INCORPORATED — MERIDEN, CONN.

Manufacturers of Welded Fabrications to Specifications

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 556.

PQ SILICATES FOR FABRICATING METAL CLEANERS

Metso Granular
($Na_2SiO_3 \cdot 5H_2O$) Sodium Meta silicate. Free flowing, white granular product.

Metso 99
($Na_2HSiO_4 \cdot 5H_2O$) Sodium Sesqui silicate. White, granular, free-flowing.

G-D
($Na_2O \cdot 2SiO_2$) Powdered Sodium Silicate. Hydrated, alkaline. Readily soluble.

G Silicate
($Na_2O \cdot 3.22SiO_2$) Hydrated powdered sodium silicate (sometimes referred to as trisilicate); rapidly soluble.

METSO PQ

looking for improved cleaning?

PQ Silicates can help. Whether you make your own cleaner or specify a compounded one, consider these advantages:

1. Freely soluble in hot or cold water.
2. Produce solutions of the right sustained alkalinity for economical grease removal.
3. Soluble silica content prevents re-deposition of dirt.
4. Soluble silica also resists corrosiveness of other alkalies.
5. Mix readily with synthetics, phosphates, other alkalies.

Send for free bulletin 17-2, "PQ Soluble Silicates in Lump and Powder Forms".

PHILADELPHIA QUARTZ COMPANY
1150 Public Ledger Bldg., Philadelphia 6, Pa.

Sodium Sesquisilicate U. S. Pat. 2145749

FOR FURTHER INFORMATION USE READER SERVICE CARD; INDICATE A 557.

Industry News

Mr. Arden discussed chromic acid. This material is not critically short at this time although it is far from being in free supply. Capacity is being increased gradually.

After extended discussion in which Mr. Zinn pointed out that unless the electroplaters got some relief, they could be forced to close their plants and would, therefore, not be available when Defense Orders came through, Mr. Duff suggested that the N.A.M.F. send him the figures for: (1) the normal requirements of the industry, and 2) the minimum requirements for keeping our doors open. It was agreed that these figures would be submitted to him so that he could present our case to the proper authorities and ask for some relief.

It has been stated in the daily press, that the International Nickel Company of Canada is installing emergency facilities to increase nickel production by 1,000,000 pounds monthly. This increase will amount to about 5 per cent of present prodiction.

It is the opinion of W. O. Zinn, President of the N.A.M.F., that the N.P.A. is sympathetic to need for materials in order that the job-shop industry may survive the transition into a Defense economy. However, the best hope for present relief seems to be through the United States Senate Select Committee on Small Business.

The National Rack and Imperial Plating Rack Companies, in keeping with their expansion program, have announced the opening of a new Chicago plant. This new associated company will be known as **The American Rack Company,** with factory and offices located in Chicago, Illinois. William Zube, Imperial Rack's Treasurer, will be the Manager.

The new facilities will be equipped with the latest machinery and other modern production units. Already in operation, it will improve the companies' services in the Midwest supplying the NaRaCo line for anodizing, plating, painting, and conveyors as far west as Wisconsin. Edsel L. Faulman is President of all NaRaCo Companies.

Philadelphia Quartz Company Celebrates 120th Anniversary. It was July 21, 1831 when Joseph Elkinton first opened the doors of his soap and candle enterprise in Philadelphia. He had recently returned from service for the Society of Friends as a teacher in the Tunessassa Indian School of New York. Although he had trained as a silversmith, the production of soaps appealed to him more. The business grew, so that by the time the founder's sons, Joseph S. and Thomas finished their schooling, they

The mark that means - LOW-COST PRODUCTION OF TOP QUALITY *Silver plating*

It's the mark you find on every Handy & Harman Silver Anode. To silver platers both in the Arts and in Industry, it means *profitable* plating because it identifies anodes free of all impurities that can cause plating troubles—anodes that conform to the highest standards in fineness and physical properties.

For uninterrupted production of highest quality plating look for the 999 "PLUS" FINE mark on the Silver Anodes you use.

HANDY & HARMAN

82 FULTON STREET NEW YORK 38, N. Y.

Bridgeport, Conn. • Chicago, Ill. • Los Angeles, Cal. • Providence, R. I. • Toronto, Canada

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 559.

Put Your FINISHING PROBLEMS IN A

HENDERSON TUMBLING BARREL

For nearly ¼ of a century HENDERSON BROS. has been helping manufacturers solve their Tumble Finishing problems with a wide variety of Tumbling Barrels . . . Sided Wood Barrels, Round Wood Barrels, Perforated, Cast Brass, Cast Iron, Welded Steel Barrels and Rubber Lined Barrels in the Tilt type and Horizontal Type for Bench and Floor installations. Where special processes call for special barrels, Hendersons is prepared to design and construct Tumbling Equipment to customer specification.

Write us, outlining your particular problem. Our Engineering and Development Service will be glad to make recommendations.

Since 1880 Designers and Builders of Tumbling Barrel Equipment.

THE HENDERSON BROS. COMPANY
137 SOUTH LEONARD ST. WATERBURY 85, CONN.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 560.

Industry News

took an active interest in the enterprise.

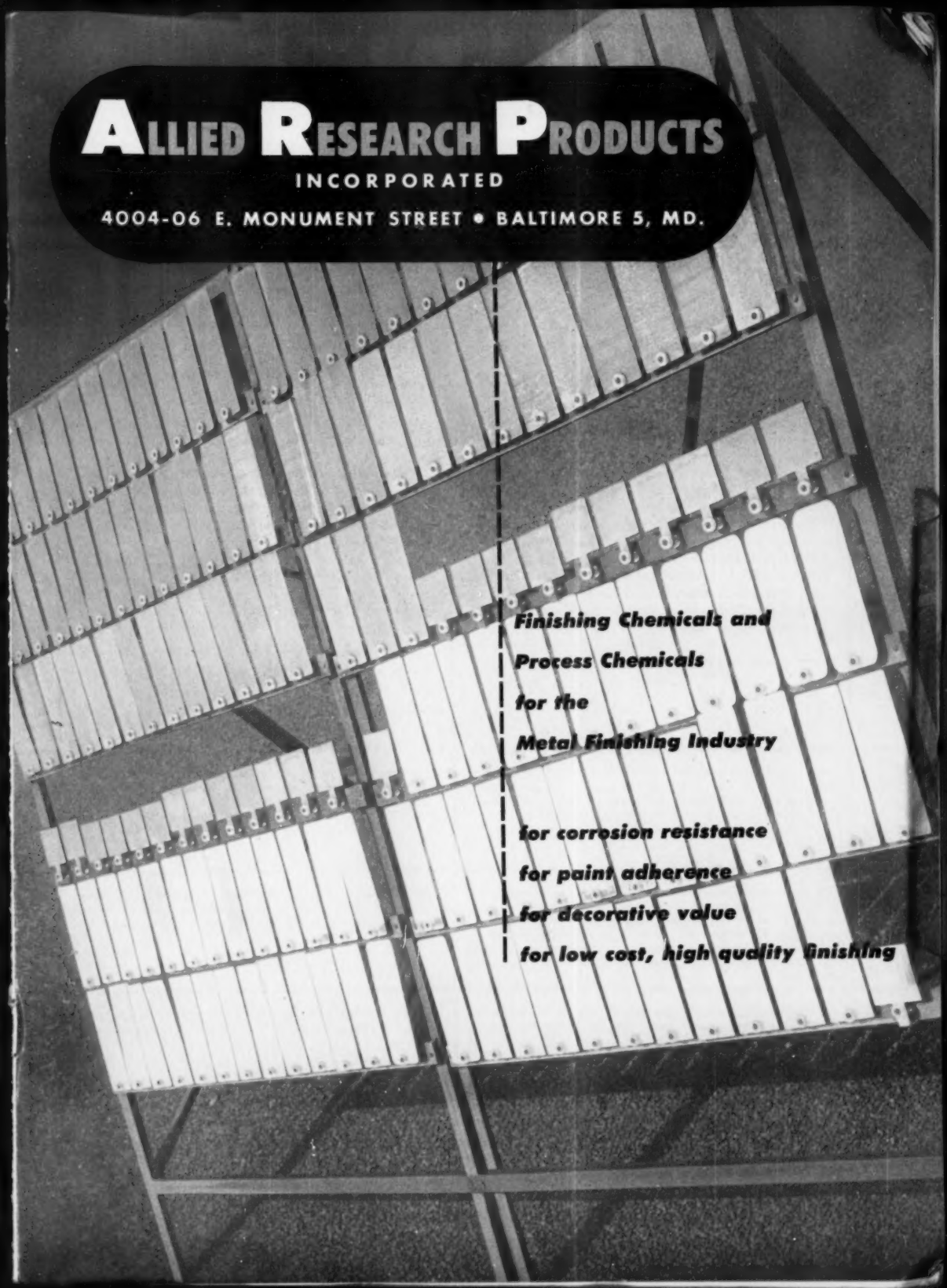
Thomas Elkinton's leaning toward technology directed his attention to a chemical, silicate of soda, mentioned in a scientific journal. Thus, it was early in 1858 that equipment was bought to experiment with the product. The use of silicate of soda in the Elkinton soaps showed a distinct advantage for increasing washing action. Silicate sales to other soap makers were inconspicuous until the War Between the States brought an embargo on southern rosin to the north and soap makers became interested in substituting silicate for rosin. The new soaps found favor with consumers, and so silicate of soda became an established product. Soaps and candles still were manufactured in the Elkinton factory, although with the introduction of the kerosene lamp, candle sales were waning.

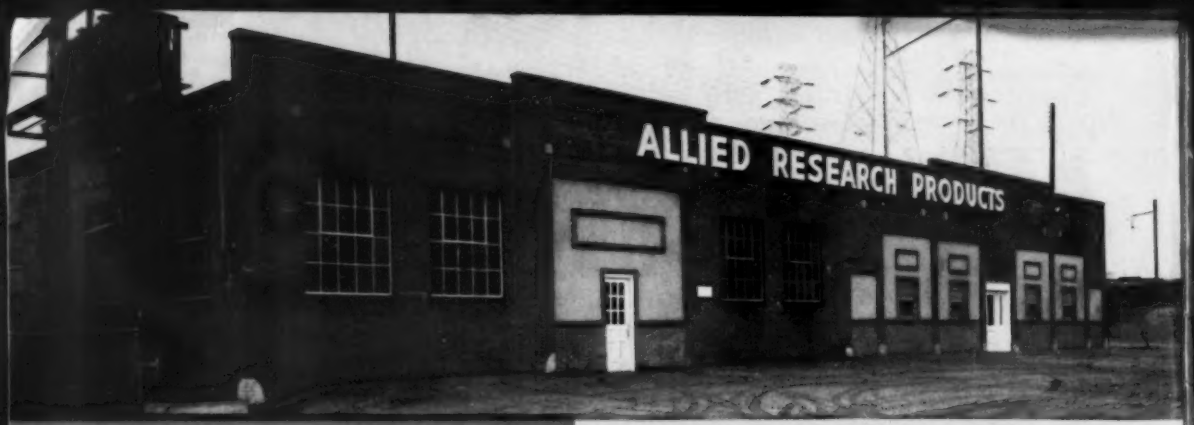
The increased acceptance of silicate as a soap-making ingredient soon required larger production. In 1864, a large factory was built at 9th and Mifflin Streets, Philadelphia, and the present firm name came into use. Again, in 1889, business growth justified expansion to the West, with a silicate factory in Anderson, Ind. At the beginning of the present century, the acceptance of the corrugated paper box as a shipping container resulted in utilizing another of silicate's properties, adhesiveness, which had been discovered earlier. A new plant opened in Chester, Pa., was devoted exclusively to manufacturing silicates of soda. At that time, the Philadelphia factory was closed and soap making discontinued.

Through the company's research over a long period of years, series of chemicals were produced by varying the proportions of the ingredients of silicate of soda which led to a variety of useful applications, among them metal cleaning, prevention of corrosion in hot- and cold-water lines, and coagulating aids for raw water supplies and waste waters.

Besides the Anderson and Chester units, plants today are located at Baltimore, Md.; Buffalo, N. Y.; Jeffersonville, Ind.; Kansas City, Kansas; Rahway, N. J.; St. Louis, Mo.; Utica, Ill. A subsidiary, Philadelphia Quartz Company of California, operates three plants, in Berkeley, Los Angeles, Calif., and Tacoma, Wash. Another subsidiary is National Silicates Limited, Toronto, Ont., Canada. Thomas W. Elkinton, great grandson of the founder, is President of the Eastern and Canadian companies, and a director of the California company. The present directors are J. P. Elkinton, J. G. Vail, T. W. Elkinton, W. Martin, J. A. Norton, C. L. Baker, A. W. Elkinton, E. A. Russell, J. C. Russell.

General Offices are situated in the Public Ledger Building, Independence Square,


ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.
Finishing Chemicals and
Process Chemicals
for the
Metal Finishing Industry
for corrosion resistance
for paint adherence
for decorative value
for low cost, high quality finishing



THIS MODERN NEW PLANT houses our offices, laboratories and pilot plant, as well as our job finishing facilities . . . among the largest and most modern on the East Coast.

New Finishing Problems Invited

Our business has grown because of our willingness to undertake research and development of new finishes as problems are presented to us by manufacturers such as you. If our present products described in this folder will not fill your bill, we urge you to discuss the problem with us in detail. No obligation, of course.

EXPERIENCED RESEARCH CHEMISTS working in this modern laboratory are your assurance of quality performance in any Allied Research product.

PROVING GROUND in our own metal finishing production plant assures satisfactory performance of our products in your plant, provides us with first hand knowledge of your daily problems.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

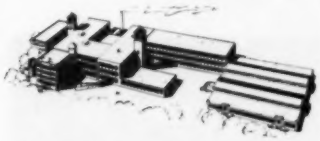
REPRESENTATIVES IN PRINCIPAL INDUSTRIAL CITIES; West Coast L. H. BUTCHER CO.
Manufacturers of Iridite Finishes for Corrosion Resistance and Paint Systems on Non-Ferrous Metals; ARP Finishing Chemicals.

(REMOVE THIS FOUR PAGE INSERT FOR YOUR DATA FILE)

Industry News

Philadelphia. Philadelphia Quartz written communications still bear the quaint salutation "Respected Friends". Those who have guided the company's affairs since that July, 1831, have retained the simple phrase, which reflects the dignified courtesy and sincerity with which the founder conducted his business.

Foxboro Adds Assembly Building to Main Plant. A new one-story building, now nearing completion, will add 50,000 square feet, or nearly 25 per cent, to the working area in the headquarters of The Foxboro Company, Foxboro, Mass., maker



of industrial instruments for measurement and control. Shown at right in the sketch, it will be used principally for the final assembling and testing of recorders and controllers for temperature, pressure, liquid level, and flow; and the transfer will permit expansion of departments which produce electronic and electric instruments and other control equipment.

In addition to the new Assembly Building and a 50 x 200-foot warehouse recently completed, a new Training School Building is being erected.

Pennsalt Production Capacity Up. The Pennsylvania Salt Manufacturing Company is currently expanding its total tonnage capacity by 23 per cent, George B. Beitzel, President, informed share owners at the Company's 101st annual meeting in Philadelphia on April 25. It has spent about $23,400,000 on expansion of manufacturing capacity and improvement of facilities since the end of the last war.

The company is now engaged in the following expansion programs, due for completion between now and early 1952, which are of interest to the plating industry:

At Portland, Ore., production of caustic soda and other electrochemical products is being increased by approximately 48 per cent, and the company is installing facilities to produce alkaline cleaners to supply the growing industry of the West. These facilities will expand the company's total capacity for these products by 30 per cent.

At Tacoma, Wash., production of chlorine and caustic soda is being increased by about 30 per cent. At the Wyandotte, Mich., works, production capacity for chlorine and caustic soda is being increased by 15 per cent, and, for the production of alkaline cleaners, by 20

Write in for your copy of our New 1951 Catalog on Schaffner's Buffing Compounds and Supplies

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 562.

Start Clean... Stay Clean!

Nancy's spent too much time washing and dressing dolly to have her fouled up . . . and you, as a plater, have invested too much time and money cleaning your metal to put it into a bath of questionable purity.

Red Label Darco S-51 quickly adsorbs impurities that would otherwise be deposited on the freshly cleaned work. It conserves scarce metals and gives you a better job with thinner deposits.

Red Label Darco S-51 is specially treated for use in plating—the only carbon that meets the benzol-mercury test! It's easy to handle . . . easy to wet . . . easy to make into a slurry. Place your order for Red Label Darco S-51 today. Nearly all suppliers carry Darco in stock . . . *so don't accept substitutes!*

With clean metal . . . keep the Bath Clean

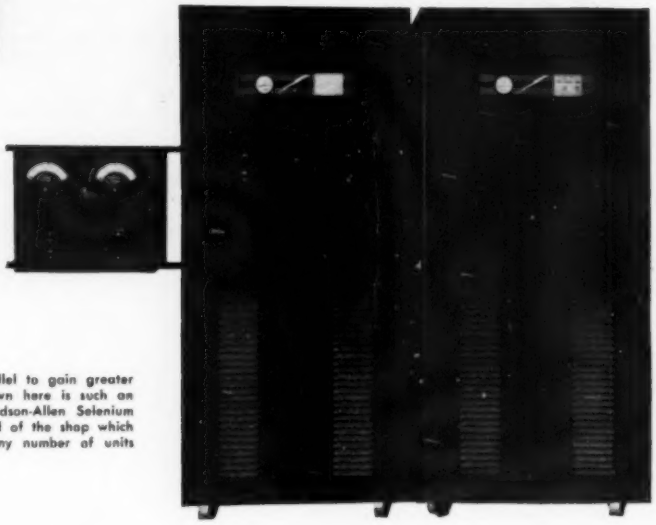
DARCO DEPARTMENT
ATLAS POWDER COMPANY
Darco General Sales Offices
60 East 42nd Street, New York 17, N. Y.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 563.

DEPENDABLE
RICHARDSON-ALLEN SELENIUM RECTIFIERS

- BASIC RECTIFIERS
- SELF-CONTAINED RECTIFIERS
- STEP-LESS VARIABLE CONTROLS
- TAP SWITCH CONTROLS

Shown here is one of numerous Richardson-Allen Selenium Rectifiers for the plating industry. Designed for heavy duty deposition, it delivers 5,000 amperes of D.C. at 12 volts from A.C. lines. A complete, highly efficient power source in a single cabinet. May be located in out-of-the-way places or close to the tanks.



R-A Rectifiers may be hooked up in parallel to gain greater capacity without increase of voltage. Shown here is such an installation composed of two basic Richardson-Allen Selenium Rectifiers. This arrangement meets the need of the shop which draws heavily upon its D.C. Practically any number of units may be so connected.

Good, even deposition, an absolute "must" in the up-and-coming plating shop or department, begins with a dependable source of D.C. power. In the busy shops of the country, ranging from single tank to highly mechanized equipment, Richardson-Allen Selenium Rectifiers have demonstrated their dependability.

The wide line of Richardson-Allen Selenium Rectifiers includes self-contained or basic and remote controlled designs with capacities from 250 to 10,000 amperes in a single cabinet. These operate from 220, 440 or 550 volt A.C. lines; 3-phase, 25 cycles or 50/70 cycles.

Outstanding advantages: high efficiency with varying loads—immunity to danger from sudden overloads — thermostatic protection — no standby losses — unbroken D.C. for chrome plating—long life with almost no maintenance.

Write for information on Richardson-Allen Selenium Rectifiers, describing your need and operating conditions.

RICHARDSON-ALLEN
CORPORATION
RECTIFIER SPECIALISTS

116-15 Fifteenth Ave., College Point, Long Island, N. Y.

MICCRO Products

Used Throughout the Plating Industry

Developed and manufactured by experienced platers

MICCROSOL ...E-1003
A new heat-cured rack coating that provides positive insulation and protection, amazing tensile strength and scuff resistance, permanent flexibility, and positive, continuous adhesion.

MICCROTEX . . .
A synthetic air-dry rack coating for all plating cycles and phosphate coatings—highly resistant to all plating solutions.

MICCROTAPE . . .
A tapered-edge, extruded tape that offers unexcelled protection for plating racks, and for masking parts prior to selective plating.

MICCROTUBE . . .
An extruded tubing for bent or straight contact wires. Also used in selective plating of simple parts.

MICCROMASK . . .
For masking of machined parts for hard chromium plating. Provides complete protection—ensures extreme accuracy.

MICCROSTOP . . .
For masking of machined parts for all plating cycles. Hairline demarcation . . . extreme accuracy.

MICCROWAX . . .
A new, single-material wax for selective stop-off, which is especially suited for masking on complicated parts and sharp edges.

MICCROSTRIP . . .
A blend of the new fast solvents for the quick, easy removal of stop-off lacquers in selective plating, and rack coatings.

MICCROLOID . . .
Industrial corrosive-resistant coating for use on all plating equipment, structural steel, walls, floors, pipe lines, air ducts, etc.

MICCROLAC . . .
Mirror-finish, water-white lacquer that protects and beautifies the finest of polished or plated metals.

Samples and descriptive literature of all Miccro Products will be sent upon request.

MICHIGAN CHROME
AND CHEMICAL COMPANY

6351 E. Jefferson Avenue, Detroit 7, Michigan

per cent. At Calvert City, Ky., Pennsalt is expanding its capacity for production of hydrofluoric and anhydrous hydrofluoric acid by 33 per cent.

The Reading Chain & Block Corporation, Reading, Pa., has changed its name to **Reading Crane & Hoist Corporation,** effective June 1, 1951. The change of name does not affect the capital structure, personnel ownership or production of the Company, and management will continue unchanged. Up to 1918, principal products of the company were chain and chain blocks, but since that time, production has been chiefly cranes and electric hoists.

The Masters' Electro-Plating Association of New York City met on April 11 to hear Mr. Joseph C. Dunn on the subject of clarification of plating specifications. Mr. Dunn, who is Chief of the Quality Control Services Unit of the New York Office of the Air Material Command, gave a most interesting talk on the methods of obtaining Air Forces approval of plating shops for work in chromium, cadmium, zinc, nickel and anodizing. He described the routine involved, the tests, and a number of the specifications. A lively discussion followed.

Important topics included: N.P.A. Regulation 2 permitting platers to place blanket orders for material under DO 99 to cover a variety of very small orders; a guide to draft deferments based on doing work for Essential Activities, according to a new list issued by the Department of Commerce; a coming Special Bulletin of the Association entitled "How To Solicit Defense Work in Plating and Metal Finishing"; Correspondence with the Bureau of Excise Taxes on the question of New York City sales taxes collectible on metals and metal-containing salts and chemicals.

Pyrene Metal Finishing in New Plant. The Metal Finishing Division, formerly located in the Pyrene Manufacturing Company plant on Belmont Ave., Newark, N. J., has now completed its transfer to enlarged quarters, the Pyrene plant on Empire St. Equipment of the newest type designed for speed, efficiency and quality control has been installed.

The new plant has about 20,000 square feet of floor space in addition to two enclosed loading platforms. Fifty per cent of the area is devoted to plating, polishing, and anodizing operations. Included is a special large tank for anodizing work up to 26 feet in length. There are plating barrels for lead, tin, cadmium, and zinc and special set-ups. The chromium installation includes two 15-foot tanks. All generators and rectifiers are installed in a separate room. About 50 per cent of the area is utilized for Parkerizing, Bonderizing, Parco Lubrizing, Electro-film, and other chemical processes for metal treatment, as well as a number of spray hoods, baking ovens, vapor degreasers, and other equipment.

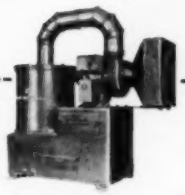
Norton Company, Worcester, Mass., has announced an expansion plan costing $6,000,000 which will increase its capacity to make grinding and lapping machines. The new plant will consist of a 740x300-foot factory joining a 360x100-foot office building. Of single-story, modern construction, it will provide 275,000 sq ft of working space and enlarge the company's machine-tool manufacture by 50–60 per cent.

Norton Company has been making grinding machines since 1900 when the Norton Grinding Company was incorporated adjacent to its wheel-making plants. That year, the first precision-production cylindical grinding machine was built. Since then, over 43,000 Norton grinding and lapping machines in more than 235 sizes and types have been sold all over the world. In a merger of 1919, this company became today's Grinding Machine Division of Norton Company.

Promat Division Announces Distributors. Ralph R. Jenkins, who was recently named Sales Manager of the Promat Division of Poor and Company, has announced appointment of the following distributors for the Promat line of metal plating chemicals and processes: **Haviland Products Company,** Grand Rapids, Mich.; **Wagner Brothers, Inc.,** Detroit, Mich.; **Donald Sales & Mfg. Company,** Milwaukee, Wis.; **Bart-Messing Corporation,** Belleville, N. J.; **Reynolds-Robson Supply Company,** Philadelphia, Pa.; **Ardco, Inc.,** Chicago, Ill.

Why it pays to SPIN-DRY plated work–small lacquered parts

Choose from 3 carefully engineered models . . .



1. **Standard Model.** Takes nearly every type of part. Built for long, trouble-free service.

Saves time . . . With the New Holland Kreider Dryer operating at 625 r.p.m. on only ¾ h.p. you can *spin-dry* a basket of parts (1140 cu. ins.) in as little as 35 seconds—no more than 2 minutes.

Improves quality . . . With a New Holland Kreider Dryer, high speed centrifugal spin-drying eliminates scarring and marring, assures smooth evenly dried surfaces, with longer lasting luster . . . fewer "rejects."

Cuts costs . . . What's more, though a New Holland Kreider Dryer occupies less than 6 sq. ft. of floor space, it's a big money saver. Power costs are low, production high—with little or no maintenance over years. And one man can operate it, easily, efficiently.

See for yourself. Write Department P-61 today for illustrated 4-page folder . . . also addresses of installations near you.

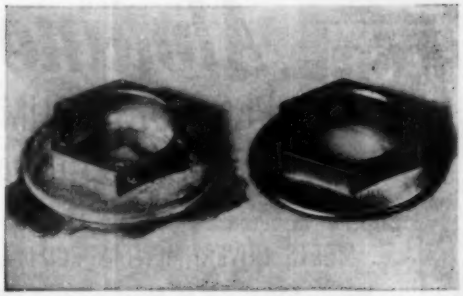
New Holland Machine Co., New Holland, Pa.

2. **With Auxiliary Steam Heating Unit.** Used for small parts that hold moisture—lacquered parts—or where cold water rinse is used.

3. **With Auxiliary Gas Heating Unit.** Used for small parts. Caution: Do not use with inflammable materials.

NEW HOLLAND KREIDER DRYER

What Does Barrel-Finishing With ALUNDUM* TUMBLING ABRASIVE Offer You?



Typical die casting before and after tumbling with ALUNDUM Tumbling Abrasive.

A variety of parts before and after barrel-finishing with ALUNDUM Tumbling Abrasive. Included are castings, forgings, stampings, and machined parts.

- It provides you with a fast, clean, economical method for finishing your metal parts to exact dimensions and degrees of surface finish.

- It enables you to remove burrs, flash, tool marks, and heat scale from large quantities of stampings, die castings, and forgings quickly and inexpensively.

- It eliminates many slow hand-finishing operations, increases production, saves time and money.

- If you don't have barrel-finishing equipment in your plant, Norton will make test runs for you, without obligation, to show you what this process with ALUNDUM Tumbling Abrasive can do for you.

A Tip on Barrel-Finishing

Don't forget that oily parts should be thoroughly cleaned before barrel-finishing. They retard the abrasive action and make it impossible to obtain bright finishes.

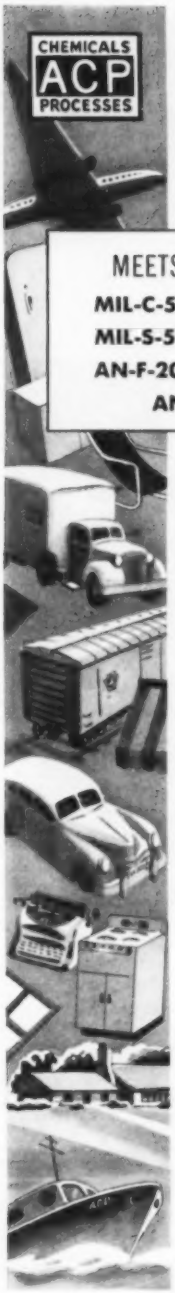
Norton Booklet, Form 301, "Precision Tumbling with Alundum Abrasive" is packed with useful information. Write for your free copy.

NORTON COMPANY
Worcester 6, Mass.

Distributors in All Principal Cities

NORTON
ABRASIVES
Making better products to make other products better

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries



Alodine®

PROTECTS ALUMINUM
ANCHORS THE PAINT FINISH

MEETS GOVERNMENT SPECIFICATIONS

MIL-C-5541	U.S. Navord O.S. 675
MIL-S-5002	16E4 (Ships)
AN-F-20	U.S.A. 72-53 (See AN-F-20)
AN-C-170 (See MIL-C-5541)	

EFFECTIVE, ECONOMICAL EFFICIENT

ALODIZING is an electroless protective surface conversion process for bonding paint to aluminum and protecting the metal.

Tough, durable ALODIZED surfaces are obtained easily and rapidly by immersion, brushing, or spraying in a multi-stage power washer.

ALODINE amorphous phosphate coatings provide extra paint permanence and extra durability for aluminum parts and products.

BRUSH "ALODINE" PROTECTS ALUMINUM IN THE FIELD, SHOP, OR HANGAR

Brush ALODINE is easily applied in a simple brush-on or flow coat process to large assemblies and surfaces—airplanes, trucks, trailers, boats, housing, building siding, railway cars, bridges, etc.—that are too bulky or too remote to be conveniently treated in tanks or a multi-stage power spray washer. The cleaning and coating chemicals for Brush ALODIZING are shipped in bulk or in the convenient Brush ALODINE Chemical Kit No. 1. This Kit contains enough chemicals to treat about 1,000 square feet of surface and is an ideal package for use at airfields of commercial airlines or of the Armed Services anywhere.

Pioneering Research and Development Since 1914

AMERICAN CHEMICAL PAINT COMPANY

AMBLER, PA.

Manufacturers of Metallurgical, Agricultural and Pharmaceutical Chemicals

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 568.

Personals

Ralph O. Anderson, Norton Company District Manager in St. Louis, Mo., has been appointed by the National Production Authority to serve in its Machinery Division as abrasive consultant. He joined Norton Company in 1912 and has served as abrasive engineer and District Manager in the Midwestern and Southwestern territories. He became District Manager of the St. Louis sales office when it was created in 1949. Prior to that he was District Manager in Denver, Colo., from 1943 to 1949.

Anderson Parrott

Gwynn L. Parrott, abrasive engineer in Illinois, will replace Mr. Anderson as St. Louis District Manager. Mr. Parrott entered the Abrasive Division of Norton Company in 1944.

Richard J. Wooley is now Plant Superintendent of Modern Plating Company, Englewood, Calif. A graduate of the School of Chemistry at Michigan State College and a Registered Professional Engineer in the State of California, he has been Plating Engineer for Chrysler Corporation; Pilot Plant Engineer, Field Service Engineer, and for the last five years, Pacific Coast District Manager for United Chromium, Inc. He is President of the Los Angeles Branch of the American Electroplaters' Society and a member of Alpha Chi Sigma.

B. R. McClure has been appointed Assistant to the Manager of Sales of the General Electric Company's Fractional Horsepower Motor Divisions at Fort Wayne, Ind. A native of Fort Wayne, Mr. McClure is a graduate of Purdue University. He is a veteran in the sales divisions, having held such positions as Group Head in charge of series motor sales; Group Head in charge of the distribution, publicity, and statistical group; and Staff Assistant to the Divisions' Manager.

Kirk C. Mattson has joined Pennsylvania Salt Mfg. Company of Washington as District Sales Manager of its Los Angeles office in the Westland Warehouse

BARREL NICKEL PLATING TO SPECIFICATION

using

SEYMOUR BRIGHT NICKEL PROCESSES

Where specific thicknesses of bright nickel are desired, use Seymour "NC" or "CK" Bright Nickel Processes in a warm plating bath. The warm type brightener solution permits specification barrel nickel plating of any desired deposit from .0002" to .0010", and at a speed four to six times faster than with a cold solution.

Seymour solutions are also available for cold plating baths where a deposit of about .0001" maximum is desired. Both warm and cold type brighteners are simple to maintain and easy to control. Deposits are adherent to properly cleaned base metals, except zinc base direct, and may be chromium plated without prior buffing or wiping.

WRITE FOR COMPLETE INFORMATION

Nonferrous Alloys since 1878

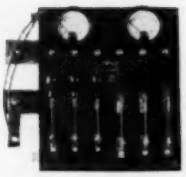
THE SEYMOUR MANUFACTURING COMPANY, SEYMOUR, CONN.

SEYMOUR

"If It's Metal Finishing Equipment or Supplies, We Have It"

TILTING TUMBLER

FOLISHING LATHE



TANK RHEOSTAT

We carry a complete line of New and Used Plating, Polishing, Spraying and Tumbling Equipment and Supplies. All of Our Manufactured and Distributed Items are Pre-Tested for Quality, Reliabilty and Service.

PESCO PLATING EQUIPMENT CORP.

OFFICE & SHOW ROOM: 182 Grand Street, New York 13, N. Y.—CAnal 6-3010-1-2
FACTORY & WAREHOUSE: 89 North 11th Street, Brooklyn, N. Y.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 570.

New! **BLACK OXIDE PROCESS for STEEL and IRON**

BLACK MAGIC (TYPE A) Pat. Pending

Our long and varied experience in the blackening field with our well-known and proven BLACK MAGIC *blackening processes, has brought out the fact that there was a need for a one-bath blackening solution which would not only produce an attractive black finish, but that the finish should have more corrosion resistance, operate at a lower temperature to decrease the dragout of solution, blacken heat-treated parts easily, be self-rectifying to inhibit the build-up in the solution of red iron oxide and countteract contaminants such as copper, zinc, etc., which frequently are introduced into the blackening solution; also, that the blackening solution in use should remain in chemical balance and new additions of salt be made by adding the required quantities of one chemically balanced salt. With these characteristics of a blackening bath in mind, the new* BLACK MAGIC *formula was developed.*

★ **Easily blackens heat treated parts.** BLACK MAGIC Type A overcomes the difficulties normally present in applying a black oxide finish to cyanide hardened pieces, which have been oil quenched, and carbo-nitrided parts.

★ **One bath! One salt!** BLACK MAGIC Type A blackening process requires only 1 bath. The same salt mixture that makes up the initial solution is used to replenish dragout losses, thus maintaining at all times a true, chemically balanced BLACK MAGIC solution; Only 6½ lbs. of BLACK MAGIC salts are required to make up each gallon of solution.

★ **Lower operating temperature.** BLACK MAGIC Type A solution is operated at a boiling point of only 290° F. This substantially decreases the amount of dragout and effects important savings in heat consumption. The higher fluidity of the BLACK MAGIC solution lowers operating costs considerably.

★ **Self rectifying.** BLACK MAGIC Type A overcomes the normal tendency in black oxide processes to build up red iron oxide in colloidal form which eventually clings to the processed work. BLACK MAGIC is so formulated to be self rectifying and under normal and many abnormal conditions will keep the bath in excellent operating condition at all times.

★ **Faster blackening cycle.** Production baths of BLACK MAGIC Type A show a decrease in the blackening time cycles of from 15 to 20%. This is an important factor in speed up in production and lower cost of operation.

★ **More corrosion resistant.** BLACK MAGIC Type A has high absorption and adsorption qualities for oils and waxes normally used as a final finish dip. This characteristic gives infinitely higher corrosion resistant qualities to the finished parts.

Write for Bulletin MB-3 *Send items of your own manufacture for sample processing.*

Mitchell-Bradford

THE MITCHELL-BRADFORD CHEMICAL CO.
2446T Main St. Stratford, Connecticut

Sales and Technical Service also available at our Chicago office: 7001 North Clark. Representatives in all leading cities.

QUALITY PRODUCTS OF CHEMICAL RESEARCH

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 571.

Personals

Building, 4820 Loma Vista Ave. He will supervise sales and service of the Industrial and Agricultural Chemicals Departments in Southern California, Arizona, Nevada and New Mexico. A native of Berkeley, Calif., he operated his own chemical sales agency, the Mattson Chemical Company, in Los Angeles until recently.

Donald A. Keating has been appointed Railroad Division Sales Manager for Turco Products, Inc. A native of Phoenix, Ariz., and a descendant of an old-time railroad family, he was educated in Los

Keating

Angeles and received his B.S. in chemical engineering at Cal Tech. Since joining Turco, five years ago, he has served in the Chicago Division as technical representative for the Mid-West states, and in Los Angeles both as Process Engineer and Assistant Manager of the Technical Department.

John R. H. Truelsen, formerly responsible for southern Wisconsin, is now Norton Abrasive Engineer for northern Illinois.

F. Donald Wing, Field Engineer in Chicago, has been appointed Abrasive Engineer. Both operate under the direction of Raymond E. Taylor, Chicago District Manager.

Frank B. Wolcott is now General Manufacturing Manager of Wyandotte Chemicals Corporation. Born in Cleveland, Ohio, the 44-year-old Wyandotte newcomer obtained his degree in geology mining at

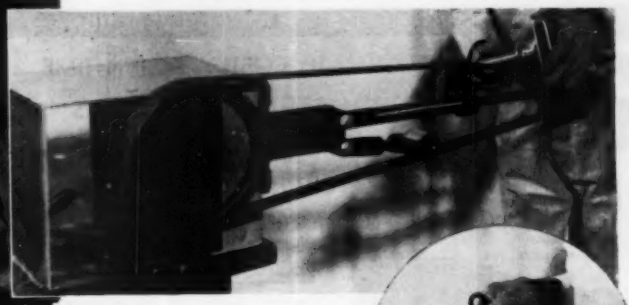
Wolcott

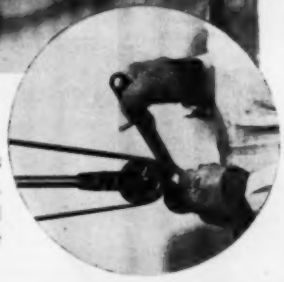
Princeton in 1930. He joined New Jersey Zinc as an engineer in the company's mines in West Virginia and in 1933 was transferred to the Palmerton, Pa., Works, where he was, successively, in charge of slab zinc and metal manufacturing until he became Plant Superintendent in 1948

The sky's the limit . . .

IN ABRASIVE BELT ADAPTABILITY!

Take this yoke sander, typical of BEHR-MANNING Product Engineering. This arrangement, used vertically, is a quick and easy way to finish inside contours such as the auto horn ring in the photo, which was previously finished with a hand-held fixture. . . . Used horizontally, this unit becomes an ideal way to finish close contours on the free-running BEHR-MANNING belt, as in the photo below. . . . Or to polish short radius curves against the small contact wheel, as in the wrench job at the bottom of this page.





***Bring your problem to the* BEHR-MANNING FIELD ENGINEERING STAFF**

Profit by the veteran experience of this methods and application department. Its value has been proven a thousand times in improved finishing methods. No obligation — just write us. Address Dept. P-7.

BEHR-MANNING®
NORTON abrasives®

BEHR-MANNING · TROY, N. Y.

COATED ABRASIVES · SHARPENING STONES
PRESSURE-SENSITIVE TAPES

FOR EXPORT — BEHR-MANNING OVERSEAS INC., NEW ROCHELLE, N. Y.

BETTER THAN EVER

The True Insulator will give you more safety than before with the same standard of insulation as always. Wire braid hose on the ¾" and 1" sizes insures absolute freedom from failure. The ½" size has been completely redesigned to give higher quality with longer life. With all these improvements the True Insulator is a better bargain than ever.

THE TRUE INSULATOR

is specifically manufactured to insulate your plating operations from grounds and short circuits through the heating coils, cooling coils, air agitation systems or other pipe connections. The True Insulator provides more positive insulation than any other type known.

Available in following sizes

½ inch.....$7.00 per pair
¾ inch.....$7.50 per pair
1 inch.....$8.50 per pair

Quantity Discounts

TRUE BRITE CHEMICAL PRODUCTS

P. O. Box 31, Oakville, Conn.

PRACTICAL PRODUCTS FOR PRACTICAL PEOPLE

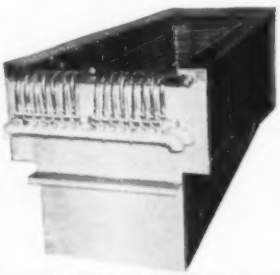
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 573.

SPECIALISTS IN *CHEMICAL-PROOF* CONSTRUCTION

Heil CLEVELAND

ELIMINATE COSTLY DOWN-TIME WITH HEIL LINED TANKS

FOR PLATING • PICKLING • ANODIZING
BRIGHT DIP • BONDERIZING • BLACKENING



Sulphuric Acid Anodizing Tank

- LONGER LIFE is assured by our many years of experience in selecting and applying the best lining for your specific requirement.
- YOU SAVE time and money when you put HEIL corrosion-proof equipment to work for you.

RUBBER • KOROSEAL • LEAD • PLASTIC

Heil PROCESS EQUIPMENT CORP.
12901 ELMWOOD AVE. • CLEVELAND 11, OHIO

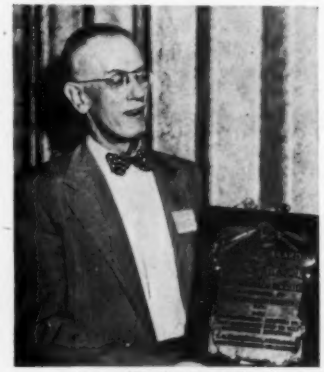
FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 574.

Personals

Dr. Harry N. Walker is now Vice-President in Charge of Sales of Richardson-Allen Corporation, manufacturer of selenium rectifiers. He has been a director of the company for some time.

Before joining Richardson-Allen, Dr. Walker was General Sales Manager of the B. G. Corporation, manufacturer of aircraft and automotive spark plugs, and prior to World War II, Professor and Chairman of the Department of Electrical Engineering at New York University

Nelson E. Cook, General Superintendent of Galvanizing for Wheeling Steel Corporation, recently received the 1950 Annual Award "for distinguished service in the field of galvanizing" of The Galvanizers' Committee of the American Zinc Institute.



Courtesy Wheeling Corrugating Company-Division of Wheeling Steel Corporation.

Nelson's father, the late William J. Cook, was a nationally recognized authority on galvanizing processes, and was known affectionately in the industry as the "dean of galvanizers". In 1932, Nelson E. Cook succeeded his father as General Superintendent of Galvanizing for the oldest and largest group of galvanizing plants in the United States. Having helped to organize the Galvanizers' Committee in 1936, Nelson Cook served as Chairman for five terms. He is at present a member of the governing board.

Albert O. Ciske, retired the last five years and now living in Orlando, Fla., and his wife Alma celebrated their 50th wedding anniversary on June 24 at an open house in the home of their son, W. A. Ciske of Chicago.

Mr. Ciske was in the jewelry and silversmith business for 48 years. He worked for many years in some of the best jewelry shops until he went into the gold and silver plating business with M. Swartz in the old Masonic Temple under the firm name Swartz & Ciske. A number of years later Ciske sold out to his partner and

You can plate faster—smoother—with fewer rejects—by using BECKMAN pH CONTROL!

BECKMAN MODEL H-2 pH METER

is one of a complete range of Beckman pH Meters available for every type of application*. The H-2 is particularly recommended for applications where high accuracy and simple operation—combined with the convenience and low cost of 115-v. AC operation—are desired.

It provides instant and direct pH readings, and a simple, built-in dial permits quick, convenient temperature compensation over the entire range of 0° to 100°C (32° to 212° F.). High reading accuracy is assured by wide-spread dual range scale that reads from 0 to 8 pH or from 6 to 14 pH at the turn of a switch. Same switch also provides instant millivolt readings from 0 to ±800 mv and from ±600 to ±1400 mv for titrations and oxidation-reduction measurements.

Built-in electrode support and compact case design save valuable space and permit easy portability to various plant locations.

Particularly important is the wide range of factory-sealed, maintenance-free Beckman Glass Electrodes available for use with this instrument . . . electrodes that are virtually unbreakable . . . that cover extreme temperature ranges from below freezing to above boiling . . . that have an unprecedented pH range with negligible errors . . . that are abrasion-resistant and chemically durable to a degree never before thought possible in glass electrodes.

*In addition to the H-2 Meter, other Beckman pH equipment includes completely automatic pH indication and control instruments for large-scale process applications . . . battery-operated models for complete portability in plant and field use . . . and a laboratory type instrument that features maximum versatility and accuracy for research and laboratory applications

In plant after plant Beckman pH Control has proved to be the key to higher plating speeds, smoother deposits, fewer rejects in virtually all types of electroplating operations—whether cadmium, copper, zinc, brass, or other types of plating.

For Beckman is the pH equipment that is equally efficient in all metal plating operations—acid or alkaline—regardless of turbidity, organic substance, or oxidizing and reducing agents!

Not only does Beckman provide a complete range of pH equipment for every application from portable plant use to completely automatic control for large-scale processes, but the Beckman line of glass electrodes is the most rugged, the most versatile, the most complete in the industry.

Particularly important to metal plating operations is the fact that Beckman High pH Glass Electrodes can be used in highly alkaline solutions with negligible sodium errors, thus simplifying the control of many types of alkaline plating operations such as cadmium, copper, zinc, brass (both for rubber adhesion and straight brass plating) and other similar metal-plating operations.

See your authorized Beckman dealer for helpful suggestions on the application of Beckman pH savings to your plating operations—or write direct

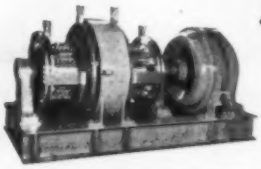
Beckman Instruments, Inc., South Pasadena 72, Calif.

Send for free booklet "What Every Executive Should Know About pH." It's helpful and informative.

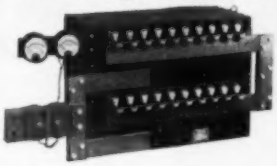
BECKMAN INSTRUMENTS
control modern industries

Beckman Instruments: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

COLUMBIA



MOTOR GENERATORS
for Electroplating Anodizing,
Electrocleaning, Electropolishing



TANK RHEOSTATS
- REVERSING SWITCHES
- TONG TEST AMMETERS

Write for Descriptive Bulletins

COLUMBIA ELECTRIC MFG. CO.
4533 HAMILTON AVE. • CLEVELAND 14, OHIO

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 576.

CONSERVE METALS while you CUT COSTS

UNICHROME COATING 218X *provides rack insulation that saves on labor . . . on drag-out losses . . . on metal build-up*

This widely used green rack coating is helping in a big way to stretch metal supplies. First, since it doesn't crack or chip even after long use in all plating baths, there's no wasteful metal build-up on the rack. Second, it bakes into a smooth, glossy coating which rinses freely, thereby helping to minimize loss of valuable plating salts by drag-out.

But that's not all. You use only a single prime coat, not only saving time and labor, but also gaining longer lasting adhesion. No lifting, no formation of pockets which drag over solutions into other baths. A non-contaminating plastisol, Unichrome Coating 218X has been approved for use in leading bright nickels.

A U.C. Service Engineer will gladly help you on application procedure—show you how to get maximum protection. Ask us also about nearby applicators who can do the job for you.

UNICHROME Trade Mark COATINGS for METALS
Metallic . . . . . Organic . . . . . Decorative . . . . . Protective

Products of UNITED CHROMIUM, INCORPORATED

100 East 42nd St., New York 17, N.Y. • Detroit 20, Mich. • Waterbury 20, Conn. • Chicago 4, Ill.
Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 577.

Personals

became manager of the Zolla Plating Company. After nine years, his son, W. A. Ciske, bought out Mr. Zolla, and the firm name was changed to A. O. Ciske & Son. In 1935 W. A. Ciske left the business, and his interest was purchased by Mr. R. Dresch. The firm name became Ciske & Dresch. When Mr. Ciske retired, he sold his interest to Mr. Dresch.

Mr. Ciske is now 76, hale and hearty, and enjoys a daily game of three-cushion billiards, a game he plays quite well.

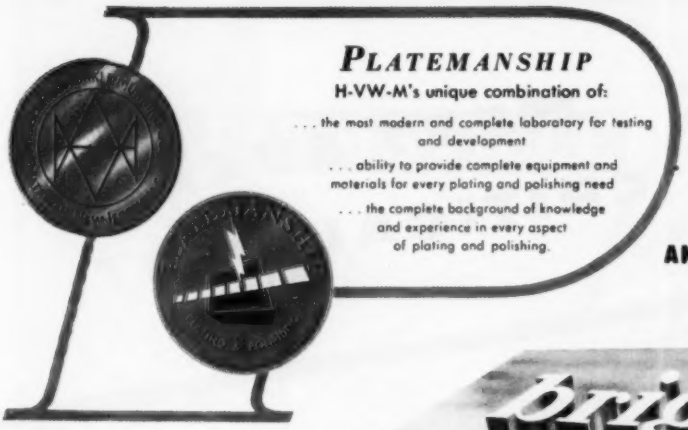
Don A. Gaines is now New England Regional Manager of the Formax Manufacturing Corporation, Detroit, Mich. He was one of the Formax sales representatives in the Detroit area and has moved his residence to 333 Buena Vista Road, Stratfield, Conn. During his 19 years of sales experience in the metal finishing field, he has acquired an enviable record as a practical technician in the application and use of the firm's products. He is particularly well versed in the installation and maintenance of spray equipment for use with liquid buffing compounds.

Gaines

William F. Clemons has been named Sales Engineer for The Udylite Corporation's Cincinnati territory, which covers southern Ohio. His headquarters are in the Roselawn Center Building, Section and Reading Rd., Cincinnati 37, Ohio.

Clemons

A graduate of Lawrence Institute of Technology in Detroit, where he received a degree in chemical engineering, he joined Udylite as a control chemist in the Customer Service Laboratory where customers' plating solutions and methods are tested and analyzed. He later was assigned to Udylite's field technical staff, servicing Udylite plating processes in customers' plants throughout the country, and recently was a member of the Sales Department in the Detroit area.



PLATEMANSHIP

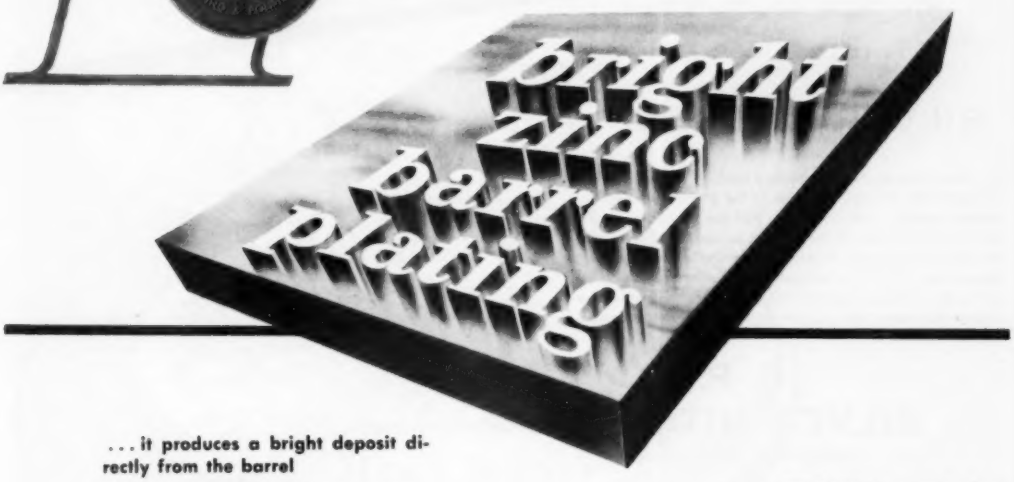
H-VW-M's unique combination of:

. . . the most modern and complete laboratory for testing and development

. . . ability to provide complete equipment and materials for every plating and polishing need

. . . the complete background of knowledge and experience in every aspect of plating and polishing.

H-VW-M
PLATEMANSHIP
AND THE BBZ-200 PROCESS
PROVIDES



. . . it produces a bright deposit directly from the barrel

. . . it develops brilliant deposits over a wide range of current densities

. . . it eliminates need for subsequent bright dipping

. . . it has unusual tolerance for impurities

. . . it combines economy with simplicity

. . . it readily accepts conversion coatings and can be soldered with relative ease

BBZ-200, is an exclusive H-VW-M development. Its use in plating solutions permits zinc-plated parts to come flashing bright from the plating barrel. Finished products and parts plated by the BBZ-200 process not only *look* brighter, they *stay* brighter longer, have higher resistance to oxidation and tarnish. Low concentration of BBZ-200 Brightener in the bath plus low consumption add up to real economy in this outstanding process.

Virtually all cyanide solutions can easily be converted to obtain the superior results obtainable only with the BBZ-200 Process. The process is a typical example of *Platemanship*—H-VW-M's unique ability to meet and even anticipate every need of industry in all phases of pickling, polishing, buffing, anodizing and plating.

FOR COMPLETE DETAILS ON THE BBZ-200 PROCESS, SEND FOR THE TECHNICAL BULLETIN

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, NEW JERSEY

PLANTS AT: MATAWAN, N. J. • ANDERSON, INDIANA • SALES OFFICES: ANDERSON • BOSTON • CHICAGO CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • MATAWAN • MILWAUKEE • NEW HAVEN NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) • UTICA

H·VW·M

7928

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

MEET EVERY CRITICAL TEST

"A. A." SILVER ANODES

. . . mean cleaner, brighter finished work . . . always. Their use results in: A large reduction in the amount of rejects of finished goods. Less stripping. Full use of the anode (no lace or herring bone formation). Less scrap. Uniform dissolution of the anode, thereby maintaining a nearly constant anode area, facilitating computation of effective surface (of particular interest to larger plants). Every anode is laboratory tested and guaranteed to give complete satisfaction under normal conditions.

C. P. SILVER NITRATE

MEETS A.C.S. SPECIFICATIONS

It is outstandingly effective for photographic purposes, and for medicinal, industrial and analytical uses. Purity is thoroughly safeguarded and tested throughout every stage of production, since our own exacting specifications and working procedures eliminate even the most minute traces of harmful impurities. This assures you the finest Silver Nitrate you can buy.

SILVER CYANIDE

More than meets all silver plating requirements. Its quality is consistently highly uniform and free from impurities. Due to its uniform particle size, APW Silver Cyanide dissolves faster. It is being used widely in silver and alloy gold plating, and also for medicinal purposes. Furnished in 100 or 1,000 ounce drums. We can ship any quantity promptly from stock.

Write for complete information and current quotations

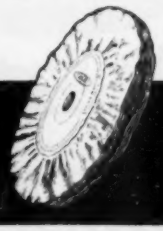
THE AMERICAN PLATINUM WORKS

231 NEW JERSEY R. R. AVENUE
NEWARK 5, N. J.

WILLIAMSVILLE Buffs

Cotton Buffs that Produce Cost Savings through Superior Performance

Prompt service— write, wire or phone!



WILLIAMSVILLE BUFF DIVISION
The Bullard Clark Company
DANIELSON, CONNECTICUT

For Any Plating Solution
Any Quantity

use an INDUSTRIAL Filter

100 to 15,000 gallons per hour. Portable and stationary models. Standard or special filtration systems engineered to meet unusual requirements.

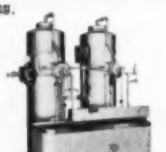
You save many ways . . .

Here's how Industrial filters keep down the cost of plating jobs—The flow rates of Industrial filters are based on the actual plating solutions involved. You know the capacity you get. In the filtration of plating solutions there is more than just the filter. With Industrial you get an adequate filter with slurry tank, motor driven pump, valves and fittings in a complete package with one, undivided, experienced responsibility—with space requirements at a minimum.

The labor, down time, and the inconveniences of cleaning, replacing the filter media, and reassembling the filter for every new filter cycle—all are eliminated by the Industrial Air-Wash Cleaning Method available for all models. It is necessary to remove the cover only when new filter cloths are installed. With Industrial filters, a clarified plating solution is always assured.

The engineering, design, and construction of Industrial filters have proved out in long service and low maintenance costs. Industrial has the experience and is large enough to handle your filter requirements. Since 1927 filters and filtration systems have been an important part of our business.

INDUSTRIAL Water Demineralizers



A Two-Bed INDUSTRIAL Water Demineralizer. Standard two-and four-bed units available with capacities of 200 to 1000 gph. Special units of any capacity engineered to requirements.

for **No stains after hot rinse. No unwanted precipitates in solutions.**

Write for full information and recommendations

FILTERS Pressure Type · PUMPS Centrifugal · CORROSION TESTING APPARATUS Salt Fog - Humidity

INDUSTRIAL FILTER & PUMP MFG. CO.

5914 Ogden Ave.
Chicago 50, Illinois

RUBBER DIVISION Vulcanized Linings • Molded Products · WATER DEMINERALIZERS

Trade Literature

L—617. Detergent Compositions—A new class of cleaning compositions, based on a chemical principle long known but not heretofore applied commercially in the detergent field, are described in a bulletin, "Solubilizing Cleaners", issued by the Pennsylvania Salt Manufacturing Company, Market Research Division, 1000 Widener Bldg., Philadelphia 7, Pa.

The action of the new cleaners is based on oversize micelles or groups of molecules, formed by the various ingredients, which have the property of dissolving not only water-soluble soils taken up by normal soap solutions but also water-insoluble soils which can normally be removed only by organic solvents. The cleaners have little saponifying action and do not remove fatty soils by this mechanism, and while performing somewhat like emulsion cleaners, are said to go far beyond them in cleaning range. In addition, the new cleaners have the capacity of removing solid soils by detergent action and continue to clean effectively even when loaded with soil. The range of solvent power are said to make them effective in removing such complex soils as buffing compounds, greases, and pigmented drawing compounds.

The SC products are clear liquids, yellow, dark brown, or cherry red in color. Only limited clinical tests have been run to date; however, these materials have been specially formulated to reduce the probability of industrial dermatitis due to skin defatting. Vapor toxicity does not exceed that of usual emulsion cleaners. The cleaners are practically neutral and have good solubility and dispersibility in water, moderately high flash point, and exhibit a high adsorption at interfaces. For your copy, use Reader Service Card.

L—618. Belt Polishing—Minnesota Mining and Manufacturing Company, 900 Fauquier Ave., St. Paul 6, Minn., has issued a 32-page catalogue, "Step Up Production with the 3M Method of Grinding and Finishing". It illustrates a large number of applications in which the use of Three-M-ite Abrasive Belts have increased production and reduced the number of operations, describes the equipment, belts and contact wheels used, and discusses the company's engineering service. For your copy, use Reader Service Card.

L—619. Tank, Rack Coating—Western Coating Company, 85 W. Union St., Pasadena 1, Calif., offers descriptive material on its Westoflex materials. No. 80 is a thermoplastic coating, which when fused for a few minutes at 325–375° F is said to form a tough-flexible, 1/64–1/4-

HAVEG PLATING AND FINISHING EQUIPMENT

WITHSTANDS HARD USAGE THROUGH AND THROUGH

YOU CAN EXPECT—and get—long service life from tanks, fume hoods, piping and all other plating and finishing equipment made of Haveg.

This is true because Haveg is resistant to acids, alkalies, salts and solvents throughout its entire mass. It is *not* a coating or a lining! It is a structural material with physical strength adequate for self-supporting equipment and withstands both thermal and mechanical shock.

Another advantage of Haveg equipment is the fact that alterations in design, as well as repairs made necessary through abuse, can be readily made on the job.

It will pay you to investigate all the advantages Haveg equipment offers you. Write today for bulletin.

HAVEG CORPORATION
NEWARK 1, DELAWARE
FACTORY: MARSHALLTON, DEL. • TEL. WILMINGTON 3-8884

CHICAGO 11	CLEVELAND 14	HARTFORD	HOUSTON 6	DETROIT 11	LOS ANGELES 13	SEATTLE 1
1701 Palmolive Bldg.	550 Leader Bldg.	57 Farmington Ave.	4601 Montrose Blvd.	2632 E. Grand Blvd.	601 W. Fifth St.	Vance Bldg.
Delaware 7-6260	Cherry 7297	Hartford 64250	Jackson 2-6065	Madison 1575	Mutual 8055	Elliot 0890

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 582.

Trade Literature

inch thick coating, resistant to strong acids, including chromic and nitric acids, and alkalies. A wide variety of applications in the plating industry are listed. Variants are also described. For your copy, use Reader Service Card.

L—620. President's Water Resources Policy Commission Report Completed—The Commission, which was appointed in January, 1950, to study and make recommendations on policies in the field of water resources, together with existing legislation, has released the last of its three-volume report, and having completed its assignment has gone out of business, Chairman Morris L. Cooke has announced.

Copies of each volume and the Summary of Recommendations may be purchased from the Superintendent of Documents, Washington 25, D. C., at the following prices:

Vol. 1, "A Water Policy for the American People"	$3.25
Vol. 2, "Ten Rivers in America's Future"	6.00
Vol. 3, "Water Resources Law"	2.25
Summary of Recommendations	0.15

The separate sections of Volume 2 may be had for prices varying from 50 cents to $1.00. The series includes the Columbia, Missouri, Rio Grande, Colorado, Connecticut, Alabama-Coosa, Potomac, Ohio, and Tennessee Rivers and the Central Valley of California.

L—621. Aluminum Data Book—A new 194-page edition of "The Aluminum Data Book", has been issued by Reynolds Metals Company. Vital facts on aluminum alloys and mill products have been condensed into a handy pocket-size manual, which contains 117 tables of data on physical, chemical, and mechanical properties; standard tolerances; weights; standard sizes and production limits; as well as much fabricating data. Included are tables showing relative corrosion resistance, the action of many chemicals on aluminum, elevated- and low-temperature properties, fatigue strengths, minimum bend radii, joining methods, finishes for aluminum, and much other information.

In addition, there are 33 pages of explanatory text covering the alloy-designation system, the temper-designation system, heat-treatable and non-heat-treatable alloys, casting alloys, casting methods, and foundry practice. Wrought aluminum mill products are detailed, and manufacturing methods are described, including blanking and forming operations, machining, forging, joining, and surface finishing.

The book will be sent without charge to engineers, designers, and technical men who request it on company letterhead. Address Reynolds Metals Company, 2500 S. Third St., Louisville, Ky.

L—622. Power-Factor Meter—A hook-on Type AK-3 power-factor meter, which permits direct measurement of power factor without cutting conductors or interrupting electrical service is described in Bulletin GEA-5469 issued by the General Electric Company, Schenectady 5, N. Y.

Used on any balanced 3-phase circuit, it gives direct power-factor readings in circuits with voltages ranging from 100 to 600 volts and currents from 15 to 600 amperes. Its frequency range is 50–90 cycles.

The new instrument, a companion to the company's AK-1 hook-on volt-ammeter and AK-2 hook-on wattmeter, described in the same bulletin, is designed for use in industrial plants where maintenance of high power factor is an important economic consideration. For your copy, use Reader Service Card.

L—623. Government Controls—Publication of a new weekly "Controls Service", indexing and digesting the welter of new price, production and distribution regulations, has just been inaugurated by The Journal of Commerce, 63 Park Row, New York 15, N. Y. This new service consists of Master Editions of all-inclusive "Controls Guide" at six-week intervals,

CASE HISTORIES

Actual Reports Available on Request

Eliminating Hand Work and Plating Rejects Caused by Inadequate Removal of Tripoli Buffing Compound from Zinc Die Castings

Parts to Be Cleaned: Zinc die castings for the hardware of one of America's finest cars.

Former Method: Parts were processed in a vapor degreaser, then electrocleaned before copper, bright nickel and/or chrome plating.

Present Method: Parts are immersed for 3 minutes in a 5 oz. per gal. solution of Magnus #7 at 180-185° F., then rinsed in hot water at 160° F. Electrocleaning follows.

Results of Operation Change: With the vapor degreaser, die castings could not be electrocleaned until hand brushing removed the buffing compound. Even then, plating rejects were high because of inadequate hand work. It was also felt that the cost of degreasing solvent was high.

Magnus #7 removes all traces of the tripoli compound. No hand work whatever is necessary. Plating rejects due to poor electrocleaning have been virtually eliminated, in spite of very rigid specifications set up by the car manufacturer. One tank of Magnus #7 lasts for four eight-hour shifts before accumulation of solids makes it necessary to make up a new solution.

The customer considers the change to Magnus #7 to have been a most profitable investment.

Maybe you are having trouble with a stubborn buffing compound. Magnus #7 may be the answer, but, if not, another of the specialized Magnus precleaners can be adapted to your problem.

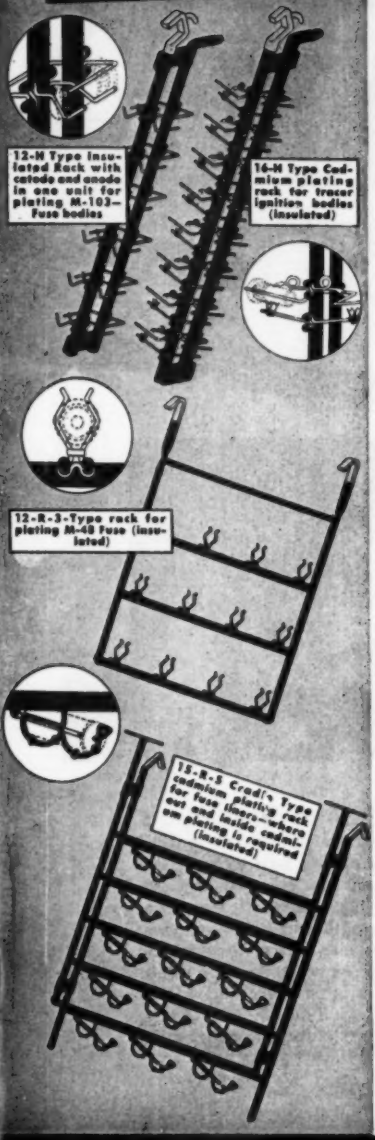
For information write Magnus Chemical Company, 41 South Avenue, Garwood, N. J. In Canada — Magnus Chemicals Limited, Montreal. Service representatives in all principal U. S. cities.

Insist On Genuine

BELKE PLATING RACKS

New — Wonderful Synthetic Insulation

FOR ANODIZING



12-H Type insulated Rack with cathode and anode in one unit for plating M-103 Fuse bodies

16-H Type Cadmium plating rack for tracer ignition bodies (insulated)

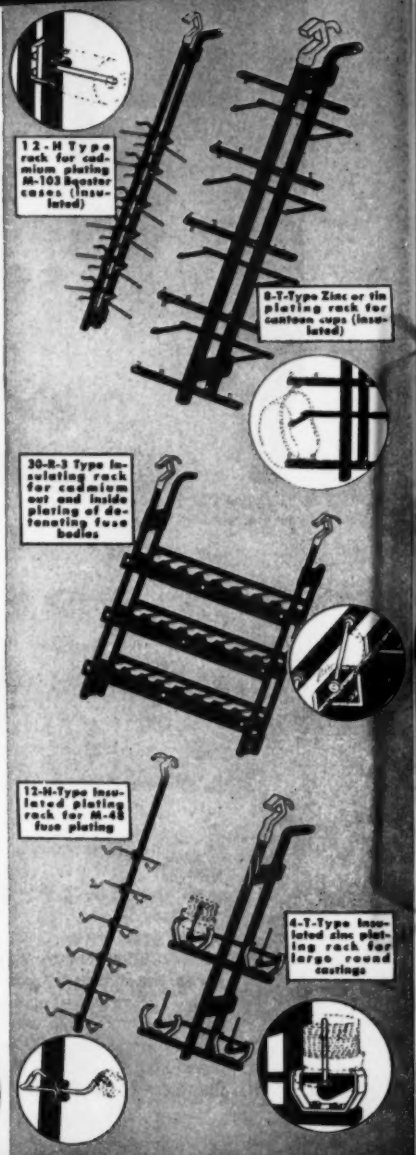
12-R-3-Type rack for plating M-48 Fuse (insulated)

15-R-5 Cradle Type cadmium plating rack for fuse liners—where out and inside cadmium plating is required (insulated)

8-H Type Anodizing Rack for airplane engine parts shown not insulated — can be furnished insulated

36-LV. Type Rack for anodizing airplane engine parts—can be furnished with or without insulation

42-R-7 Type anodizing rack for small airplane engine parts — furnished with or without insulation



12-H Type rack for cadmium plating M-103 Booster cases (insulated)

8-T-Type Zinc or tin plating rack for canteen cups (insulated)

30-R-3 Type insulating rack for cadmium out and inside plating of detonating fuse bodies

12-H-Type insulated plating rack for M-48 fuse plating

4-T-Type insulated zinc plating rack for large round castings

BELKE MANUFACTURING COMPANY
947 NORTH CICERO AVENUE · CHICAGO

NEW THINGS

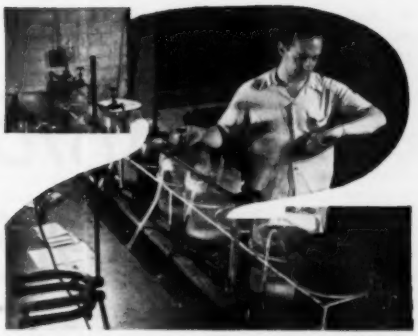
from PROMAT

TO HELP YOU MEET TODAY'S METAL FINISHING DEMANDS

1. PREPARATION ... Addition Agents to Improve Acid Cleaning . . . Iron Sequestering Agents

THE protective and/or beautifying value of a metal finish depends entirely on its adherence to the base metal. All too many finishes fail prematurely due to lack of adherence caused by faulty cleaning. NEW PROMAT ADDITION AGENTS add cleaning power to acid solutions, speed the action, insure uniform attack and retard formation of a film of iron salts on the metal surface. They are useful in all pickling operations prior to metal finishing and are recommended for use by electroplaters, hot dip galvanizers, porcelain and synthetic enamellers, etc. Use of PROMAT IRON SEQUESTERING AGENTS in the rinse water insures complete removal of the film of iron salts which inevitably forms on ferrous metals in any acid dip.

Addition of the above simple-to-use, economical chemicals to the acid dip and rinse water insures a truly clean surface to which the metal finish will adhere perfectly. The resulting improvement in appearance and quality and reduction of rejects is rapidly winning the acclaim of metal finishers handling both commercial and military work.



2. PLATING ... Acid and Alkaline Zinc Baths .. Addition Agents for Purifying, Conditioning, Brightening ... Cadmium Baths ... Copper Baths

ZINC. Promat 99M2X is an outstanding, efficient, easy-to-use zinc bath. To each gallon of 99M2X, simply add an equal amount of water plus 80 c.c. of Promat C-42 Addition Agent and 1 gram per gallon of Promat C-42B Addition Agent. This bath can be operated at current densities up to 200 amps per sq. ft. without burning. Throwing power, speed and efficiency are excellent. Fine grain structure is assured and lustre is good. Parts being plated in this bath are ready for any of the Promat secondary treatments listed below under "protection."

CADMIUM. Promat cadmium electrolytes are shipped in concentrated form. Can be used as received to permit use of very high current densities or can be diluted with an equal amount of water to give one of the finest all around cadmium baths on the market today.

COPPER. Promat C-201M is a specially prepared copper plating solution which is shipped in concentrated form. Any need for outside purchases of copper cyanide or other necessary chemicals for original makeup is eliminated. Promat bright copper Addition Agent C-201BA added at the rate of 50 c. c. per gallon to this solution produces a bath unexcelled in brightness and throwing power. The Promat copper bath operates efficiently at low current densities and as low as 140°F. Its low metal content substantially reduces loss from dragout. For superimposed alternating current baths, Promat offers a special copper plating solution again eliminating the necessity of purchasing copper cyanide or any other necessary chemicals.

MAINTENANCE SOLUTIONS. Promat offers the necessary maintenance chemicals and purifiers in easy-to-use form for all Promat zinc, cadmium and copper baths.

3. PROTECTION ...Secondary Chrome Film Treatments for Increasing Corrosion Resistance of Zinc and Cadmium, for Producing Long-Lasting Bright Zinc, for making Zinc Readily Paintable

PROMAT protective coatings for zinc and cadmium surfaces represent a long research program into the subject of chrome films. The result is a complete line of products including: the lowest cost chrome finish ever offered; the brightest, longest-lasting finish available; an olive drab variety with new characteristics of appearance and protection and other protective coatings for electroplated and hot dip zinc, zinc base die castings and cadmium.

These Promat protective coatings are secondary treatments applied by simple immersion of the already-plated work. All provide a superior product for the user; any specifications or inspections for commercial or military work can be met. In the long run they cost less and provide unexcelled quality of finish.

For a complete discussion of any Promat product, write, or phone today.

PROMAT DIVISION, Poor & Company
851 South Market Street • Waukegan, Illinois
Distributors in Principal Cities

Backstand Method Saves Time!

Milwaukee Electric Tool Corp. eliminates one complete operation . . . increases production 40% . . . gets better finish on tools!

Problem: The Milwaukee Electric Tool Corp. had a time-consuming method for sanding cast aluminum motor housings for portable electric tools. First they polished with a hard wheel. Then they sanded with a #46 set-up wheel and finished with a grit #100 set-up wheel. This was too long and too costly an operation.

Solution: The Milwaukee Electric Tool Corp. switched from the hard wheel and set-up wheels to the backstand belt for this polishing job.

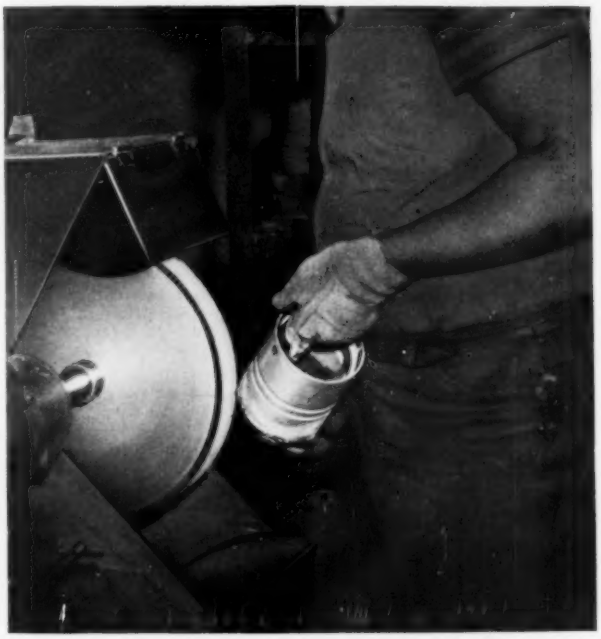
Result: Now one Armour Backstand Belt does the work of the hard wheel and the #46 set-up wheel—eliminating one operation. A better finish is obtained and production is up 40%!

Manufacturers of hundreds of different industrial and consumer items have proved that the backstand belt method is more efficient and more economical than the set-up wheel.

If you are grinding, polishing or finishing flat or contoured surfaces, cast pieces, stamped pieces or forged pieces, the backstand method can help you with your production problems.

To learn more about advantages of the backstand belt method, write for our free booklet.

We recommend buying through your Industrial Distributor



MAIL THIS COUPON TODAY

Please send me the booklet "Facts about Backstand Belt Grinding and Polishing."

Name.....

Title.....

Firm.....

Address.....

City.....*Zone*.....*State*.....

Armour's abrasive belts are only part of a complete line of abrasives built to rigid quality specifications. There are sheets, rolls, discs, and other more specialized shapes.

ARMOUR *Coated Abrasives Division*

SHEETS • ROLLS • BELTS • DISCS

Armour and Company • North Benton Road • Alliance, Ohio

Trade Literature

and weekly "Bulletin Summaries" designed to keep each master edition constantly up-to-date. Subscriptions may be had at $25 per year from the New York Journal of Commerce.

L—624. Zinc-containing Paint—Industrial Metal Protectives, Inc., 401 Homestead Ave., Dayton 8, Ohio, offers an 8-page Bulletin Sheet Z-251 describing the Zincilate coating. It contains a protective zinc dust, said not to be on any critical list at the time of announcement. The bulletin deals with the advantages, methods of application, and physical and chemical properties. For your copy, use Reader Service Card.

L—625. Pumps, Heat Exchangers and Floor Drains—A 4-page illustrated bulletin issued by Nukem Products Corporation, Buffalo 20, N. Y., describes its line of Nu-Kast pumps (without stuffing box) and floor drains made of corrosion-resistant resin and its line of heat exchangers made of Karbate. For your copy, use Reader Service Card.

L—626. Corrosion-resistant Cement Over Steel Gridwork—An illustrated bulletin showing the step-by-step procedure to be followed in applying corrosion-resistant cement over steel gridwork has been issued by the Pennsylvania Salt Manufacturing Company, Special Chemicals Department, 1000 Widener Building, Philadelphia 7, Pa. Cement on steel grating linings offers an exceptionally high resistance to erosion. For your copy, use Reader Service Card.

L—627. Ventilation and Operation of Open-Surface Tanks—This is the title of American Standard Safety Code Z9.1–1951, approved on January 4, 1951. Among sections in this 24-page standard are: Classification of Open-Surface Tank Operations; Ventilation; Control Requirements for Enclosing-Hood Exhaust, Lateral Exhaust and Canopy Hoods; Minimum Control Velocity; Spraying Operations; System Design; Air-Flow Producing Equipment; Operation; Personal Protection; Special Precautions for Cyanide; Inspection, Maintenance and Installation; Vapor Degreasing Tanks. Appendices furnish properties of solvents; hygienic standards for toxic mists, fumes, gases or vapors and for toxic metal salts; drawings of a variety of hood designs; corrosion resistance of hood and dust materials; exhaust velocities; sample calculations. Copies may be obtained from American Standards Association, Inc., 70 E. 45th St., New York 17, N. Y., at 75 cents.

L—628. Blast Cleaning—The Pangborn Corporation, Hagerstown, Md., announces a 4-page, 2-color Bulletin 219 on its Rotoblast "Turn-style Table" for airless blast cleaning of castings. Illustrated with photographs, a schematic diagram, and a dimensioned line drawing, it shows cleaning in one section while the other section is being loaded. Actual savings, how the machine works, protective features for operators, crane-loading possibilities, variations, and engineering specifications are given. For your copy, use Reader Service Card.

L—629. A. S. T. M. Standards on Industrial Water—The second edition of this publication (February, 1951) prepared by A. S. T. M. Committee D-19 on Industrial Water, brings together in convenient form the various A. S. T. M. standard and tentative methods of sampling, analysis, and testing of industrial water. The methods have been developed particularly for the examination of water employed industrially in the generation of steam or for process or cooling purposes, and for the examination of deposits formed from such waters. The publication includes 31 methods, which cover sampling, analysis, corrosivity tests, methods of reporting, and general testing methods, also specifications for substitute terms relating to industrial water. A list of A. S. T. M. symposia and technical papers on industrial water is included. Copies of this 168-page compilation, heavy paper cover, can be obtained from American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa., at $2.00 each.

L—630. Stop-Off Material—Western Coating Company, 85 W. Union St., Pasadena 1, Calif., and P. O. Box 748, Manor, Pa., offers a 4-page bulletin which describes its Maskcoat No. 2, designed for sharp, quick masking jobs. It

If you make a bath like this

...it's time you switched to NEW SILVER SOL-U-SALT

Note these advantages!

- **High Purity eliminates harmful ingredients introduced to plating solution.**
- **No filtering necessary.**
- **Eliminates waste.**
- **No rough deposits.**
- **Dustless, eliminating hazard of other type air-borne powders.**
- **Does not affect the free cyanide content of the plating solution.**
- **Precalculated — 2 ounces avoirdupois of Silver SOL-U-SALT contains 1 troy ounce of metallic silver.**

Available in 100, 200, 500, 1000 and 2000 ounce plastic packages.

SILVER SOL-U-SALT is a water soluble double cyanide salt. It is a pure white crystalline, free-flowing salt of known and definite chemical composition. Developed for making new Potassium Silver Cyanide plating solutions or for metal replenishment in existing baths.

No more dirt, dust, mixing, calculating or filtering!

Sel-Rex

An exclusive development of

SEL-REX PRECIOUS METALS, INC.

229 Main Street • Belleville 9, N. J.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 587.

is said to be suitable for all common plating solutions without contaminating them; to have excellent adhesion, still being easily removed; and to be suitable for remelting and reuse. For your copy, use Reader Service Card.

L—631. Paint Heaters for Hot Spray Process—An 8-page bulletin from Bede Products, Inc., 4311 Ridge Road, Cleveland 9, Ohio, gives full information on the complete line of Bede Paint Heaters. Information about the hot spray process is also given. The bulletin shows five heater models, along with complete descriptions and specifications, as well as pictures of actual installations. For your copy, use Reader Service Card.

L—632. Chromium Directly Over Zinc—The Wire Coating & Manufacturing Company, 395 E. 131st St., Cleveland 8, Ohio, has issued a 4-page brochure, "W-C-M Process Chrome Over Zinc", of a descriptive character. A minimum thickness of 0.0003 inch of zinc is applied in a bath containing WCM Zinc Brightener, cold rinsed, dipped in WCM After Zinc Brite Dip, cold and hot rinsed, and chromium plated, preferably in a 53 oz/gal bath, containing 2 oz/gal boric acid if deep throw is desired. For your copy, use Reader Service Card.

L—633. Chemical Resistant Plastic Pipe, Fittings—Complete engineering data on tubing, pipe, valves and fittings of Ace-Saran and Ace-Parian (polyethylene) plastics are given in a 16-page, 2-color bulletin released by American Hard Rubber Company, 11 Mercer St., New York 13, N. Y. Resistant to most chemicals, these materials are light-weight, tough, and durable and have high impact strength. Of particular interest are tables of properties and of resistance to a long list of common chemicals. The bulletin also gives bursting and working pressures, standard sizes and weights, etc., and offers helpful information on the fabrication of complete systems from these new plastics. For your copy, use Reader Service Card.

L—634. Protective Coatings—United Chromium, Inc., 100 E. 42nd St., New York 17, N. Y., offers a 4-page bulletin, "Ucilon Specialized Industrial Protective Coatings", which describes its vinyl-base, phenolic-base, fish-oil-base, chlorinated-rubber-base and water-emulsion coatings and their fields of application. For your copy, use Reader Service Card.

L—635. Stainless Steel Marking—Ateenate, Inc., 11 Harcourt St., Boston 16, Mass., has issued a folder describing how, by means of the Ateenate process, stainless steel may be provided with a highly resistant marking, including lines 0.001-inch wide or half-tone photographs, up to 150 screen. The marking is black oxide on the metal background or metallic on a black oxide background. Applications and properties are listed. For your copy, use Reader Service Card.

L—636. Sound Film Catalogue—Seventy-two sound films that cover general-interest subjects, product information, and training-and-instruction courses are listed in a new 1951 sound-film Catalogue B-4761 available from the Westinghouse Electric Corporation, Box 2099, Pittsburgh 30, Pa. The catalogue provides a page of descriptive text (with illustrations) for each film, with a list of people whom the particular film should interest, and film size, projection time, type of film, and shipping weight. Typical films are: general interest—"Electrical Proving Ground"; product information—"It's CSP for Me"; training-and-instruction courses—"Hints on Electrical Servicing in the Air-Conditioning Industry".

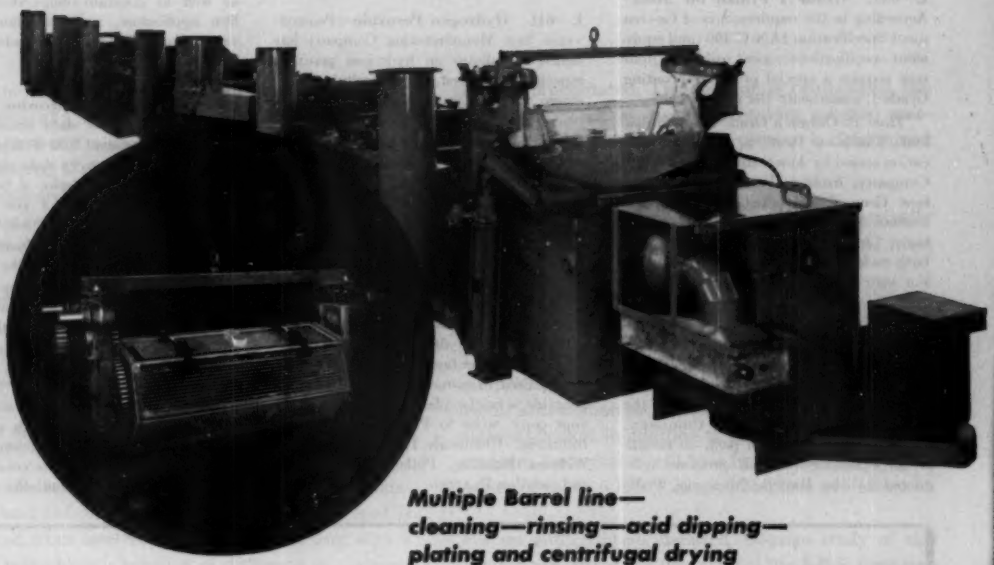
Six basic rules of operation are provided to ensure a successful film showing, and how-to-order information is included. All films are loaned free to organized groups; cost of transportation must be paid by the borrower. For your copy, use Reader Service Card.

L—637. Wet Blasting—A 4-page illustrated folder describing a line of newly developed, compact wet-blasting units has been issued by The Cro-Plate Company, Inc., Hartford 5, Conn. Having no moving parts, the units are designed for high-production-rate deburring, descaling, stock removal and general surface finishing. For your copy, use Reader Service Card.

L—638. Vapor Degreasing—A 21-page handbook on vapor degreasing of metal parts has been published by the Phillips Manufacturing Company, 3475 W. Touhy Ave., Chicago, Ill. It answers most questions generally asked about vapor de-

Economical
BLAKESLEE
SOLVENT VAPOR
DEGREASERS
USE LESS
SOLVENT
BLACOSOLV
Stabilized Degreasing Solvent — one price, one solvent for all metals
NIAGARA
Metal Parts Washers for use with cleaning compounds on either batch or production jobs.
Blakeslee Solvent Vapor Degreasers USE LESS SOLVENT because of the patented construction and operational features. Metal parts are made chemically clean and dry in just a few seconds. Save time, labor, rejects with a Blakeslee Solvent Vapor Degreaser. A Blakeslee engineer-trained representative is available to solve your specific degreasing problems.
G. S. BLAKESLEE & CO.
1844 S. 52nd Avenue • Chicago 50, Illinois
New York, N. Y. Toronto, Ont.

CROWN PLATING BARRELS



Multiple Barrel line—
cleaning—rinsing—acid dipping—
plating and centrifugal drying

CROWN LUCITE CYLINDERS

Can be operated through the entire cycle cleaning—rinsing—acid dipping—and plating solutions.

Whether your production requires a single barrel or a multiple set up for cleaning, rinsing, acid dipping, and plating, there are Crown barrels to fit the job.

Write for complete details

CROWN RHEOSTAT AND SUPPLY COMPANY

3465 N. KIMBALL AVENUE • CHICAGO 18, ILLINOIS

INDICATE A 509

Trade Literature

greasing: what vapor degreasing is and to what types of materials and manufacturing it can be applied. Numerous photographs of various types of units along with useful data charts are included. For your copy, use Reader Service Card.

L—639. Grade I Finish on Steel—According to the requirements of Government Specification JAN-C-490 (and equivalent specifications), most ordnance items now require a special protective coating, Grade I, underneath the paint finish.

"How To Obtain a Grade I (or Equivalent) Finish on Steel" is a 4-page publication issued by American Chemical Paint Company, Ambler, Pa., which describes how Granodine is used to supply this coating, by spraying, dipping, or brushing. Complete sequence of operations, bath make-up, and cost data are included. For your copy, use Reader Service Card.

L—640. Solving Heat Transfer Problems—New laboratory data on the use of Platecoils as a medium of heat exchange are available in a technical manual published by the Platecoil Division of the Kold-Hold Manufacturing Company. These data are based, in part, on results of an extensive research program conducted by the Battelle Memorial Institute, involving all styles and representative sizes of Platecoils. The technical manual simplifies the process of selecting and applying industrial heat-transfer equipment by supplying charts and formulas to aid in the basic calculations of industrial heating and cooling applications. For your copy, write to Kold-Hold Manufacturing Company, Lansing, Mich., and mention PLATING.

L—641. Hydrogen Peroxide—Pennsylvania Salt Manufacturing Company has issued a bulletin on hydrogen peroxide especially prepared, in nontechnical language, for workers who need a compact, ready reference of a general nature. Industrial executives and purchasing agents who do not require complete technical information will also find the bulletin useful as a concise reference.

A number of suggestions for the application of this product are presented to acquaint the reader with possible ways in which hydrogen peroxide may be used to greater advantage. Recommendations are also made on the use, handling, shipping and storing of hydrogen peroxide. For those who are unfamiliar with the terminology used in connection with hydrogen peroxide, a brief explanation is given. For your copy, write to Pennsalt Chemicals, Industrial Chemicals Department, 1000 Widener Building, Philadelphia 7, Pa., and mention PLATING.

L—642. Paint Testing Instruments—Gardner Laboratory, Inc., 4723 Elm St., Bethesda, Md., has issued a 32-page catalogue describing and illustrating its line of "Testing Instruments for the Paint and Other Industries". These include instruments for determining viscosity, film thickness, drying time, abrasion resistance, hardness and adhesion, portable gloss and reflection, appearance and color, as well as constant-temperature baths, film applicators, and miscellaneous devices. For your copy, use Reader Service Card.

L—643. Brush-on Corrosion Protective Coating—New data presented by Carboline Company, 7603 Forsyth Blvd., St. Louis 5, Mo., in its data sheet C-33 indicates that "B" Resin, a furan-base coating introduced over a year ago for experimental purposes only, may be superior in corrosion resistance to any other type of brush-on coating on the market.

Advantages of the new coating—now in commercial production—are described in Bulletin C-32: (1) flexibility without the use of a plasticizer, which means that embrittlement cannot occur as a result of the leaching out of plasticizer; (2) polymerization just short of the gel stage done in manufacturing, after which the resin is mixed with solvents and gelling inhibitors and packaged. As the ready-mixed coating solution is applied, the solvents

GUARANTEED

BUFFING AND POLISHING COMPOUNDS

BUFFS—POLISHING WHEELS

BACKED BY

TRADE MARK
MATCHLESS
REG. U.S. PAT. OFF.

QUALITY and DEPENDABILITY Since 1877

Your Guarantee of Low Cost Efficient Operation

THE MATCHLESS METAL POLISH CO.

726 Bloomfield Ave., Glen Ridge, New Jersey — 840 W. 49th Place, Chicago 9, Illinois

How to Determine Impurities in Copper Plating Baths

SILVER in copper plating baths may be determined colorimetrically, by using a carbon tetrachloride solution of dithizone to produce the colored solution. The hue measured is that of the mixed color of silver keto dithizonate and cupric keto dithizonate. Small amounts of certain other metals do not interfere, nor is separation of the silver required.

CHLORIDE, also, may be determined colorimetrically. The method depends upon the addition of a known quantity of silver ions and determining the excess of silver ions remaining after silver chloride has been precipitated. The excess is determined by the mixed color of silver and cupric dithizonate.

LEAD traces are determined as follows: Organic material is oxidized with phosphoric acid and the lead is separated from interfering ions by extracting with a carbon tetrachloride solution of dithizone in the presence of potassium cyanide. Transmittance of the solution is measured and the quantity of lead determined from a calibration curve.

CHROMIUM: To determine chromate chromium, nitric acid is added to oxidize any reducing agents, phosphoric acid is added to make a complex with Fe^{+++}, and diphenylcarbazide is added to form a colored complex. Transmittancy of the solution is measured, and the amount of CrO_3 present as chromate is read off the calibration curve.

For total chromium analysis, iron is first removed by precipitation. The chromium is oxidized first by fuming with perchloric acid and then by boiling with ammonium persulfate in the presence of silver ions. The silver is precipitated. The solution is centrifuged, the transmittancy of the clear supernatant solution measured, and the amount of CrO_3 present is determined from the calibration curve.

NICKEL can be accurately determined colorimetrically by forming nickel dimethylglyoxime but copper must first be removed quantitatively.

A.E.S. RESEARCH PROGRAM

The American Electroplaters' Society is conducting a comprehensive research program and has developed useful information on current plating problems. International Nickel, in addition to its other support of this program, feels that it will be a further service to make copies of these A.E.S. Research Reports available.

For an authoritative, detailed, 54-page study of this subject, we offer you a free copy of the A.E.S. Research Report, Serial No. 16, entitled "Determination of Impurities in Electroplating Solutions." Use coupon now.

The International Nickel Company, Inc.
Dept. P, 67 Wall Street
New York 5, N. Y.

Please send me a copy of A.E.S. Research Report, Serial No. 16, entitled "Determination of Impurities in Electroplating Solutions."

Name.....Title.....

Company.....

Address.....

City.....State.....

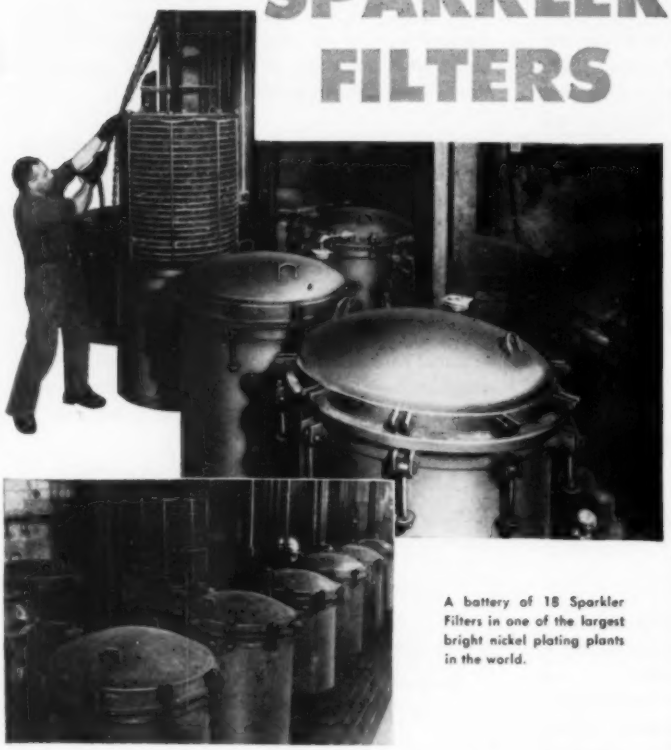
9

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

NO SHUT DOWN

To Carbon Treat Solution with SPARKLER FILTERS



A battery of 18 Sparkler Filters in one of the largest bright nickel plating plants in the world.

Carbon treatment without shut down is accomplished by cutting out one or two units in a battery of filters, removing the cartridge assembly of filter plates, and replacing with a new plate cartridge dressed with clean filter paper. The proper amount of carbon is mixed with water in a standby tank and recirculated through the filter thus depositing the carbon on the new plates in a cake of uniform thickness and density. The solution requiring a carbon treatment is then circulated through the carbon beds giving the plating solution the carbon treatment without contaminating the tank or stopping plating operations.

The quick change feature of the plate cartridge in Sparkler filters permits replacing a set of plates in a matter of minutes. Production can be resumed without appreciable interruption.

Sparkler Horizontal Plate Filters give absolutely sharp filtration at all stages of the cycle.

SPARKLER FILTERS

SPARKLER MANUFACTURING CO.
Mundelein, Illinois

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 592.

Trade Literature

carry off the gelling inhibitors, and polymerization of the film is completed on the surface in 2–4 hours; (3) high solids content and relatively impermeable films, resulting in fewer coats being required for adequate protection; (4) availability in brick red, iron yellow, aluminum, gray and black. For your copies, use Reader Service Card.

L—644. Industrial Mobilization Survey Report—Issued by The Chicago Electroplaters' Institute, 35 E. Wacker Drive, Chicago 1, Ill., this report gives the combined facilities of Chicago job platers in terms of number of employees, gallons of plating solutions, amperage, floor space, polishing and plating equipment, and valuation. It lists the names and addresses of all Institute members and offers the Institute's services.

L—645. "Techniques of Plant Maintenance, 1951"—This book, which offers an extensive discussion of recent developments in plant maintenance, has just been published by Clapp & Poliak, Inc., the management of the Plant Maintenance Show held in Cleveland last January, and contains the proceedings of the Plant Maintenance Conference held in conjunction with the show. Unlike the 1950 volume, it is printed and bound instead of mimeographed.

More than forty experts in the field contributed papers on preventive maintenance, inspection procedures and frequencies, records and reports, training personnel for maintenance, organization and management for maintenance, maintenance costs, incentive payment of maintenance workers, planning and scheduling maintenance operations, applied lubrication in industry, housekeeping, painting and decorating, floors and standards of sanitation. Additionally, there are specialized discussions on maintenance of electrical equipment, power-plant and heating equipment, problems of the small plant, selection and maintenance of lighting equipment, maintenance in chemical plants and in metal working plants.

The book, which contains 228 pages, 8½ x 11 inches, and is illustrated with 48 tables, diagrams, illustrations, graphs and charts, is available from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y., postpaid for $6.00.

L—646. Belt Polishing—The Carborundum Company, Niagara Falls, N. Y., offers a 4-page bulletin describing its "61" contact wheel for longer belt life, more pieces per belt, less operator fatigue, better finish and less down-time. For your copy, use Reader Service Card.

ROHCO *Nationwide Distribution*

R. O. HULL & CO., INC.
E. B. Wild, Tech. Rep.
1350 N. Sedgwick
Chicago 10, Ill.

ARDCO, INC.
Chicago 38, Ill.

ARMALITE CO., LTD.
Toronto 6, Canada

DANIELS PLATING BARREL & SUPPLY CO.
Newark, N. J.

DAVIES SUPPLY & MFG. CO.
St. Louis 3, Mo.

ENTHONE, INC.
New Haven 11, Conn.

W. D. FORBES CO.
Minneapolis 11, Minn.

FORCITE CORP.
Rocky River 16, Ohio

INDUSTRIAL CHEMICALS & EQUIPMENT CO.
Minneapolis 15, Minn.

A. J. LYNCH & CO.
Los Angeles 21, Calif.

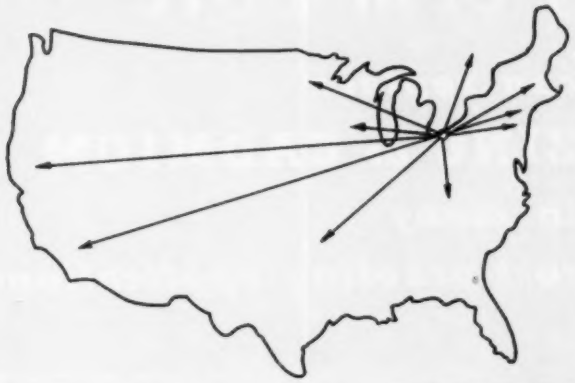
A. J. LYNCH & CO.
San Francisco 3, Calif.

J. C. MILLER CO.
Grand Rapids 3, Mich.

GEO. L. NANKERVIS CO.
Detroit 23, Mich.

STANDARD CHEMICAL CO.
Grand Rapids, Mich.

A. T. WAGNER CO.
Detroit 7, Mich.



NO-CRO-MIST (Triple Power)—Soluble addition agent to control chrome spray. Proved essential in thousands of gallons of chrome baths.

20XL CADMIUM BRIGHTENER—Absolutely without equal for cadmium plating.

AIRCRAFT BLACK CADMIUM DIP—Simplest and best for the purpose.

100 BARREL ZINC BRIGHTENER—Chrome-like deposits directly from the bath; fastest plating; lowest cost.

303 STILL ZINC BRIGHTENER—Bright, uniform deposits; widest plating range; highest throwing power.

ZINC PURIFIER—Keeps zinc bath in tip-top condition; minimizes brightener consumption.

NO-FLASH—Minimizes gas explosions in zinc plating and alkaline cleaners.

RINS-AID—Added to rinse tank to repel water; helps prevent staining; saves buffing—all at negligible cost.

HULL CELL EQUIPMENT—Essential to every plant. For bath control to give peak production and quality. Model "W" Hull Cell now available for tests at elevated temperature and with agitation.

Distributors of ROHCO PRODUCTS are selected to give you the benefit of years of experience in plating procedures. All ROHCO PRODUCTS are the culmination of constructive research on production requirements for the best in plating. They are your assurance of Quality, Service and Superior Plating Performance.

R. O. HULL & CO., INC.

1302 PARSONS COURT ROCKY RIVER 16, OHIO

Perm-Cote

can replace

ZINC or CADMIUM

in many

rust-proofing applications

NEW! Your products are given a permanent rust-proof layer. Perm-Cote converts any steel or iron surface to a dense, non-metallic phosphate coat. The corrosion resistant qualities of the absorbent coating are multiplied by impregnation with a special oil that leaves the products dry to the touch.

GOV'T SPECS: Oil-impregnated parts show a salt spray resistance far exceeding the 36-hour test required by Army Specification 57-0-2c, Type II, Class B. The corrosion resistance of the phosphate coating itself is demonstrated by the fact that non-oiled parts have a salt spray resistance of 12 hours.

PROOF! You can supply the best proof! Send samples of your production work for Perm-Coting. Your inspection and tests when the samples are returned will tell you the whole story. Upon request, you can have the findings of both the government and private industry proving the superior rust-proofing achieved by Perm-Cote.

APPLICATIONS! Armament (rockets, mortar shells, machine gun links, gun barrels, other ordnance parts); metal fasteners (nuts, bolts, washers, screws); springs; hardware (hinges, hand tools, casters); appliances; sheet metal parts, and many others.

INVESTIGATE!

- ☐ Write for descriptive literature.
- ☐ Send samples of your work to be coated.
- ☐ Request a Detrex Field Engineer to call.

106A

DETREX Corporation

BOX 501, DETROIT 32, MICH.

Equipment and Supplies

E—702. Belt Polishing—Behr-Manning Corporation, Troy, N. Y., announces the development of a remote-control arm for use on backstand installations in conjunction with the Delta Idler Unit.

The advantages are said to be: (1) The operator has, at all times, complete control of belt tracking, particularly where

narrow belts and wheels are used, 1½-inch and narrower. (2) The elimination of down-time where belt guards have to be removed for belt-tracking alignment. (3) Any desired belt alignment can be easily and quickly obtained by the operator from the front operating position of the polishing lathe. For further information, use Reader Service Card.

E—703. Odorless Emulsion Cleaner—FO-106 Solvent Emulsion Cleaner (a concentrate) was developed by Fine Organics, Inc., Aviation-Industrial Chemicals Division, 211 E. 19th St., New York 3, N. Y., to meet the needs of users who find cresylic acid odors and skin burns troublesome. It meets fully the requirements of Air Force Specification 20015E and U. S. Navy specification C-147, Type I.

In use it is diluted with 4–9 parts of kerosene or Stoddard solvent. The diluted mixture is applied by brush or spray, then rinsed off with cold or hot water. No oily film remains; dirt and grease are emulsified and carried off in the rinse. Inasmuch as painted surfaces are not harmed, a 1–9 solution may be used, without rinsing, to wipe down production machines.

For parts cleaning and soaking to remove greasy deposits it is used either in dip tanks or washing machines. FO-106 may be diluted with water in all proportions for this use and heated to 160° F for spray cleaning in process work. For further information, use Reader Service Card.

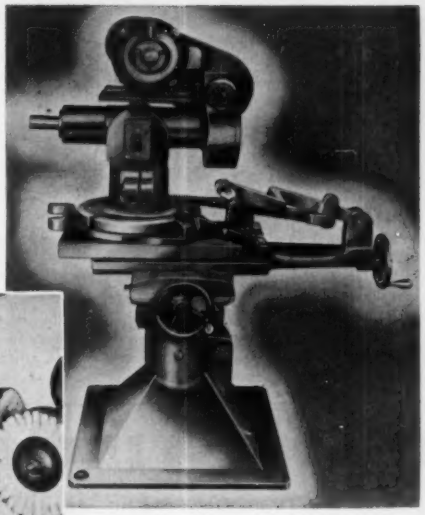
E—704. Corrosion-Resistant Finishes for Zinc—United Chromium, Incorporated, 100 E. 42nd St., New York 17,

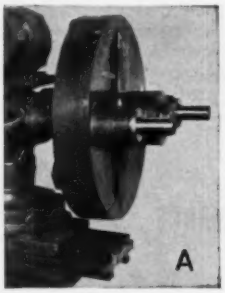
ACME Automatic Polishing and Buffing Machines

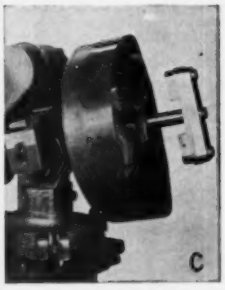
The ACME Type B-10 Semi-Automatic

IS A VERSATILE PRODUCTION MACHINE

This machine gives very efficient production as one operator normally operates two or more units, one at each end of the lathe, loading and unloading one machine while the other has work in contact with the wheel.







A Type B-10 equipped with A-2 head handling parts up to 12" diameter. Vacuum chucking available.

B Equipped with Acme patented Geared Chuck which keeps rectangular or other out-of-round work in constant uniform contact with wheel. Two buffs finishing sides and top in one operation.

C Geared chuck for polishing or buffing faucet bodies. Production up to 240 pieces per hour, one man handling two machines.

This single spindle machine is used with the conventional lathe for finishing such cylindrical parts as cooking utensils, plumbing goods, electrical fixtures and appliances, reflectors, hub caps, automotive accessories, and numerous other parts.

Toggle slide, vertical and cross slide adjustments permit quick set ups when changing from one job to another. Additional accessory equipment can be furnished for finishing an unusual variety of out of round parts as well as cylindrical work.

CATALOGS ON REQUEST

ROTARY STRAIGHT LINE SEMI-AUTOMATIC AND SPECIAL *Polishing and Buffing* Machinery

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

ACME *Manufacturing Co.*

1645 HOWARD ST. DETROIT 16, MICH.

Builders

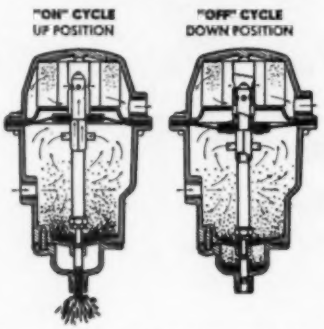
Equipment and Supplies

N. Y., has added two new compounds to its line of Unichrome Dip Compounds for decorative and protective finishing of zinc. Identified as Unichrome Dip Compounds 1060 and 1070, they are used to produce corrosion-resisting chromate-type conversion coatings that are black or olive drab in color and lustrous. The finishes are produced on a metal-conserving deposit of 0.002–0.0005 inch of zinc. The process is a simple dipping one which can be carried out at room temperature.

Other Unichrome Dip Compounds are available for producing clear finishes on zinc plate and also yellow iridescent coatings on zinc plate or zinc die castings. For further information, use Reader Service Card.

E—705. Corrosion-resistant Coating—The Atlas Mineral Products Company, Mertztown, Pa., announces a new coating, Alkaloy 550, which is said to be resistant to all alkalies, solvents, salts and most acids. Available as a high-solids liquid, it is converted at the time of use to a jet-black resilient solid. Products of this general type based on furfuryl alcohol have been known since 1940 when Atlas introduced Alkor, but the new coating has flexibility, not previously available. Alkaloy 550 is available in small amounts for experimental purposes and in unlimited quantities with proper priority. For further information, use Reader Service Card.

E—706. Air-cleaning Valve—A newly engineered line of valves for automatic removal of contaminants and precipitates from compressed-air lines, after-coolers,



sumps, tanks and air-brake systems has been announced by the Wilkerson Corporation, 1749 S. Broadway, Denver, Colo. Claims made include elimination of manual attention or adjustment, as well as savings in man-hours, critical maintenance materials, air-tool repair parts, and pneumatic-machine replacements.

When the air line is not in use, the diaphragm is forced down by back pressure with the O-ring sealing the sump bottom. As air is used the pressure differential raises diaphragm and shaft, seals bottom of middle chamber, opens bottom sump, and blasts out contamination. For further information, use Reader Service Card.

E—707. PR Plating for Nickel, Copper Conservation—According to G. W. Jernstedt, Manager of Electroplating Projects, Westinghouse Electric Corporation, 306 Fourth Ave., Pittsburgh 30, Pa., periodic-reverse copper plating provides a chromium-on-copper finish that is as bright as the standard finish and has satisfactory corrosion resistance. Where nickel is permitted, PR plating makes it possible to substitute copper for a major part of the nickel normally used, it is said. For further information, use Reader Service Card.

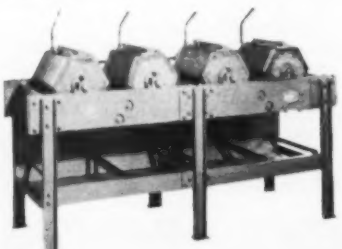
E—708. Filterless Dust Collector—Model 4N20 Dustkop dust collector, the smallest in the line of out-of-doors exhaust-type units announced by Aget-Detroit Company, Ann Arbor, Mich., is intended for use where remotely located dust sources have toxic fumes, vapors, or obnoxious odors. Although required floor space is only 12 x 23 inches, the unit nevertheless develops a rated 437 cfm

FASTER FINISHING ...

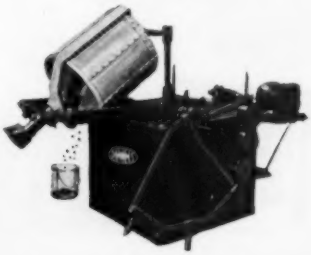
COMPANIONS IN HIGH PERFORMANCE

DANIELS

Reduce cost of cleaning, deburring and burnishing stampings, screw machine parts and small castings with the Daniels Multiple Tumbling Barrel, which combines efficiency and versatility. A single motor drive operates any number of cylinders, yet each cylinder is individually controlled with a clutch. It's ruggedly constructed and costs little to maintain.



The Daniels Type OLS Plating Barrel, for fastest, low-cost plating of small parts in bulk, features: fastest loading and unloading; no hoists or door lids to bother with; oblique angle cylinder for speedier, more uniform deposits, with no gas accumulation; unique contact design means *all* the current goes to the work.



DANIELS PLATING BARREL & SUPPLY CO.

MANUFACTURERS and DISTRIBUTORS

Electroplating and Polishing Equipment and Supplies

129 Oliver Street, Newark 5, N. J. • Tel. MArket 3-7450

Write today for new illustrated catalogs.

PRECIOUS METAL SALTS & SOLUTIONS

As specialists in the precious metals, we have both the facilities and the trained personnel best able to produce salts and solutions for the plater. As a result, ours enjoy a well earned reputation for high quality and consistent performance.

RHODIUM PLATING SOLUTION

It was in our plant that the answer to the problem of rhodium plating on a commercial scale was found. Our solution is made under the direct supervision of the men responsible for this development.

PLATINUM PLATING SOLUTION

We have developed platinum plating to a point where it stands upon a truly scientific basis. Both flash and heavy deposits are made from the same solution.

PALLADIUM PLATING SOLUTION

Produces a flash plate in from 15 to 60 seconds. Heavy deposits can be made from the same solution. Gives excellent results in plating connectors, wave-guides and other electronic equipment.

CONCENTRATED GOLD PLATING SOLUTION No. 319

Containing one ounce of fine gold.

CONCENTRATED REPLENISHING SOLUTION No. 320

Containing one ounce of fine gold.

CONCENTRATED UNDERPLATE OR STRIKE No. 321S

Containing one-half ounce of fine gold.

GOLD COLORING SOLUTIONS

For light, yellow, red and green gold.

HIGH GOLD CYANIDES

Our sodium-gold cyanide contains 71.5 per cent of fine gold and our potassium-gold cyanide 67 per cent as compared with commercial salts of 46 and 41 per cent. Gold content for gold content, our high gold cyanides cost you no more. We make the commercial 46 and 41 per cent salts too.

SILVER SALTS — SILVER ANODES

We make silver cyanide and silver nitrate as well as silver anodes.

BAKER & CO., INC.
113 Astor St., Newark 5, N. J.

New York • San Francisco • Chicago

Available for Immediate Shipment Attractive Values

THE FOLLOWING EXCELLENT REBUILT AND GUARANTEED ELECTROPLATING MOTOR GENERATOR SETS AND RECTIFIERS, WITH FULL CONTROL EQUIPMENT:

1—7500/3750 AMPERE, 6/12 VOLT, **A. P. MUNNING** "OPTIMUS." Complete Controls.

1—6000 AMPERE, 2-6 VOLT, **JANTZ AND LEIST.** Separately Excited. Excellent Condition.

1—6000/3000 AMPERE, 6/12 VOLT, **CHARLES J. BOGUE.** Synchronous Motor.

1—5000/2500 AMPERE, 6/12 VOLT, **EAGER ELECTRIC CO.** Separately Excited. Excellent Condition.

1—3000/1500 AMPERE, 12/24 VOLT, **HANSON-VAN WINKLE-MUNNING CO.** Synchronous Motor. Exciter-in-Head. Excellent Condition.

1—3000/1500 AMPERE, 6/12 VOLT, **HANSON-VAN WINKLE-MUNNING CO.** Synchronous Motor. Full Control Equipment.

1—2000/1000 AMPERE, 6/12 VOLT, **A. P. MUNNING** "OPTIMUS." Excellent Condition.

1—1500/750 AMPERE, 6/12 VOLT, **HANSON-VAN WINKLE.** Excellent Condition.

1—1000/500 AMPERE, 6/12 VOLT, **ELECTRIC PRODUCTS CO.** Separately Excited. Excellent Condition.

1—2000 AMPERE, 50 VOLT, **CHANDEYSSON ELECTRIC CO.** ANODIZING UNIT. Synchronous Motor. Full Controls.

2—1000 AMPERE, 30 VOLT, **IDEAL.** Full Control Equipment.

1—1000 AMPERE, 40 VOLT, **CHANDEYSSON ELECTRIC CO.** Anodizing Unit. Synchronous Motor Drive. Excellent Condition.

1—400 AMPERE, 40 VOLT, **"M.G.C."** Anodizing Motor Generator Set. Exciter-in-Head.

5—**GREEN SELECTROPLATERS,** 1800 AMPERES, 12 VOLTS, for operation on 220 volt, 3 phase, 60 cycle.

1—**GENERAL ELECTRIC CO.** COPPER OXIDE RECTIFIER, 2000 AMPERES, 6 VOLTS. With 220 volt, 3 phase, 60 cycle input.

2—**UDYLITE-MALLORY** RECTIFIERS, 1440 AMPERES, 6 VOLTS, with 220/440 volt, 3 phase, 60 cycle input.

4—**GENERAL ELECTRIC** COPPER OXIDE RECTIFIERS, 500 AMPERES, 6 VOLTS, for operation on 220 volt 3 phase, 60 cycle.

1—**UDYLITE SEMI-AUTOMATIC PLATING TANK,** Korroseal-lined, size: 19′ long x 5′ wide x 4½′ deep. Excellent Condition.

M. E. BAKER CO.

25 WHEELER STREET
CAMBRIDGE, MASS.

Equipment and Supplies

and 5000 fpm velocity at the inlet, suction adequate to handle a buffing, polishing or grinding wheel up to 10-inch diameter, or two wheels for similar work from 3- to 7-inch diameter.

The unit is entirely self contained, motive powers being a 1/3-hp 3600-rpm continuous-duty motor direct driving a self-clearing paddle-wheel-type fan. All material is removed in a cyclone separator, except the toxic odors and fumes and extremely fine dusts, which are exhausted to the out-of-doors. It may be had with optional inlets: single 4-inch or 3-inch; double 3-inch. For further information, use Reader Service Card.

E—709. Wheel for Portable Polishing—An improved Sand-O-Flex polishing wheel to be known as Model 350R, is now in production at the plant of Merit

Products, Inc., 4023 Irving Place, Culver City, Calif. The new unit is a brush-backed polishing device that may be attached to any rotating shaft.

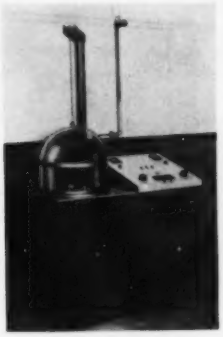
The cover has been concaved so that the knurled nut be flush with the face of the tool, thus materially reducing the bulk and increasing maneuverability. Weight has been decreased by 4 oz for easier handling. Loading of the refill cartridge has been simplified. Overall diameter is 5½ inches. The wheel has eight replaceable brushes fastened to its perimeter, which back up and "cushion" eight strands of abrasive cloth. As the wheel rotates, the 1-inch wide abrasive strips mold to the contour of the work piece. At normal speed, the wheel delivers 14,000 strokes per minute. As the abrasive wears, it is cut or torn off, and new abrasive is fed out from the central magazine. By changing grit, all types of finishes can be obtained—from coarse to very fine satin finishes. For further information, use Reader Service Card.

E—710. Chain Conveyor—From the Southern Engineering Company, 249 N. 1st St., Burbank, Calif., comes the Chain-Veyor, a light-capacity power-driven overhead chain conveyor, said to provide dependable, trouble-free, long-time operation, yet cost about half as much as conventional conveyors.

Complicated and fast-wearing parts have been eliminated. Short-radius curves and track sections are easily combined so that changes or additions can be made

quickly. It will handle loads up to 60-pounds per 12-inch intervals. Instant adjustment of conveyor speeds of from 3 to 9 fpm while the unit is in operation is made possible by the varispeed drive. Higher or lower speed ranges are available on special order. For further information, use Reader Service Card.

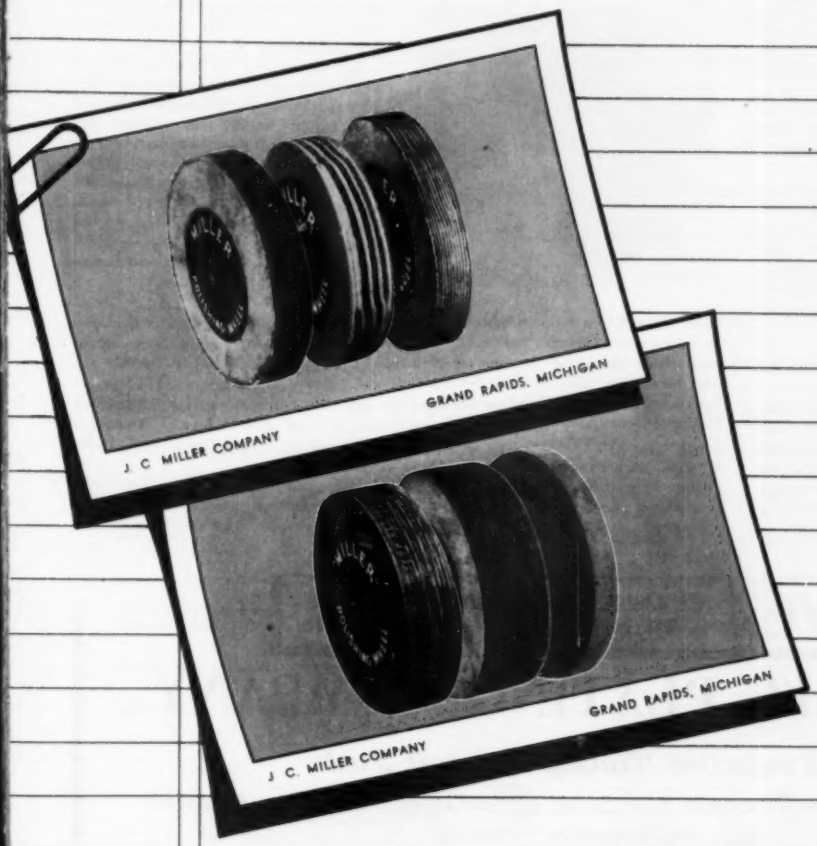
E—711. Vacuum Coating—A vacuum system designed for a wide variety of uses in research, control, and production has been added to the catalog of RCA industrial equipment, according to the RCA Engineering Products Department, Camden, N. J.



This RCA Type EMV-5 Vacuum System serves such applications as evaporation of metals and salts, sputtering, applying metallic films, drying, preparation of specimens for electron microscopy. It may also be used industrially for vacuum coating of many items such as mirrors, lenses, vacuum tubes, and plastic objects on a production basis.

The EMV-5 consists essentially of a vacuum chamber (18-inch bell jar, base plate, and terminals), a high-speed pumping unit, for evacuation to from 1 to 10^{-5} mm mercury (measured by a cold-cathode discharge gauge) and power supplies. For further information, use Reader Service Card.

E—712. Rustproofing Process—Recommended as a replacement for cadmium or zinc in many rustproofing applications, Perm-Cote, a new phosphate coating material, has been developed by Detrex



Send for illustrated Catalog

Note to Metal Finishers:

The selection of the proper polishing wheel for your work is an important factor in determining the outcome of your entire finishing operation--so choose wisely! Remember, that today and always, it is sound judgement to –

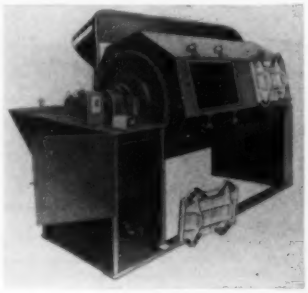
Buy Satisfaction ··· Buy Miller!

Equipment and Supplies

Corporation, Box 501, Detroit 32, Mich. When immersed in a solution of the material, iron and steel surfaces are chemically converted into a dark-gray, uniform, dense phosphate coating. After rinsing, the highly absorbent coating is impregnated with a rustproofing oil known as Perm-Oil, giving the products a corrosion resistant layer that is dry to the touch. Standard salt spray tests indicate a resistance well in excess of the 36 hours required in U. S. Army Specification 57-O-2c, Type II, Class B.

Typical applications are: metal fasteners, springs, hardware and hand tools, appliances, sheet-metal parts, rockets, clips and links, mortar shells, etc. For further information, including corroborative tests made by government agencies and private industry, use Reader Service Card.

E—713. Tumbling Barrel—Made for constant or variable speed, the new "Murco" tumbling barrels by D. J. Murray Manufacturing Company, Wausau, Wis., is made in compact design with both motor and operating mechanism totally enclosed. The only exposed parts are the controls and magnetic reversing starter, making them completely safe in operation. A limit switch permits operation only when the hood is closed. Illustrated is the 7½-hp constant-speed model. The variable-speed 7½-hp model has speeds from 8 to 25 rpm, with an infinite range of speeds in-between to meet operating conditions. Speed changes may be



made while the barrel is in motion. The foot-operated hydraulic brake at floor level stops the barrel in any position. The barrels are also made in 5-hp and 3-hp sizes. For further information, use Reader Service Card.

E—714. Rust Preventive Coating Machine—A new machine for the application of rust preventive coatings has been announced by the Cincinnati Cleaning and Finishing Machinery Company, Schmidt Bldg., Cincinnati 2, Ohio. Especially designed for the application of government specification No. AXS-673 Corrosion Preventive Compound, the machine includes a wire-mesh conveyor belt, which carries the parts through the following operations at speeds variable from 1½ to 3 feet per minute: loading, oil spray, drain, infra-red drying, cooling, and unloading.

Among features, the manufacturer lists explosion-proof switches, motors and wiring; sparkproof pumps, exhaust fan and dust system; supply tank for rust preventives; belt-cleaning tank on return leg of conveyor; adjustable infra-red drying lamp bank; automatic carbon dioxide fire protection with automatic fire curtains. Forty six feet long, the conveyor will accommodate parts up to 22 inches high and 48 inches wide. For further information, use Reader Service Card.

E—715. Pre-Finish Metal Cleaner—An acid phosphate cleaner developed expressly for the preparation of metal surfaces for painting, lacquering, or japanning, has been added to the Houghton line of metal cleaners by E. F. Houghton & Company, 303 W. Lehigh Ave., Philadelphia 33, Pa.

This cleaner, named Houghto-Clean 313-A, conditions metal for final finishing by removing soil, such as processing oils

YES! WE BARREL CHROMIUM PLATE SCREWS, RIVETS, NUTS AND OTHER SMALL PARTS

KNIGHT PLATING COMPANY

Production Plating of Small Parts

PERM-COTE—New Phosphate Coat Developed by Detrex Corporation—Approved for Automobile Production

COPPER—NICKEL—CADMIUM—ZINC—ELECTROLYTIC ZINC PHOSPHATE—CHROME

OXIDIZED COATINGS: BRIGHT—BLACK—DICHROMATE

BRIGHT NICKEL—To .001" or More Thickness

POLISHING/BUFFING: AUTOMATIC MACHINE (Patent Applied For) FOR SCREWS, HIGHEST SPEED—AVERAGE 75,000 PER HOUR

SPECIFICATION PLATING—LABORATORY CONTROL—INSPECTION—PROMPT SERVICE

PURVEYORS TO AUTOMOBILE INDUSTRY

SHIP TO US—WE RESHIP TO ANY DESTINATION—RAILROAD SIDING—TRUCK DOCKS

3143 Bellevue Avenue • W. B. KNIGHT, *President* WAlnut 3-6100 • Detroit 7, Michigan

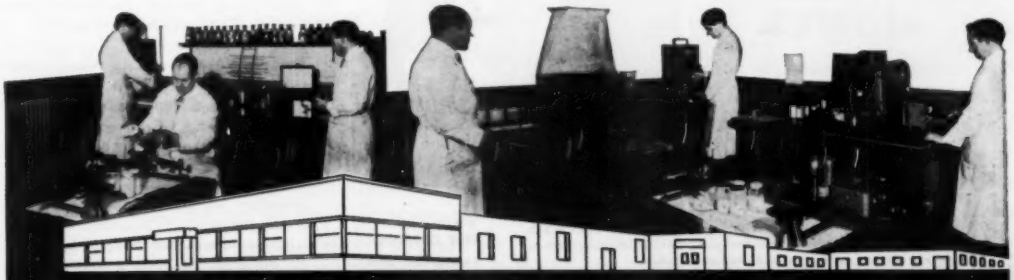
Member of

National Association of Manufacturers — Michigan Manufacturers Association

The Plating Institute — Detroit Board of Commerce — National Association of Metal Finishers

. . . replaces Chlorinated Solvent Degreasers

We have worked out a cleaning process for all metals in our laboratories that utilizes emulsion cleaners of the W/O type, based on petroleum products, to replace hot chlorinated solvent degreasing. . . . In effect, this system is equivalent to spraying the work with solvent, while immersed in water, rather than in air. . . . Since these emulsions are characteristically unstable, mechanical agitation is required to maintain dispersion of the solvent in the water phase. This agitation may be induced by propeller type mixers or by a pump-and-jet system. Both are effective and engineering details are available. . . . The two-phase bath is built up of petroleum solvent procured at low cost by the user and treated with a small proportion of Northwest Addition Agent #230. The two-phase bath can also be prepared by adding directly to the water, 5% to 20% Northwest Emulsion Cleaner #3. These baths may be heated to the maximum of 160° F., depending upon the solvent used. . . . In some cases the agitation may be dispensed with, but in all cases the two-phase precleaning must be followed by a thorough spray rinse. This rinse has a unique cleaning effect in conjunction with a displacement film deposited on the metal in the emulsion precleaner. . . . This film is extremely thin and invisible, but is essential to the complete removal of microscopic particles of foreign matter (smut). . . . Parts are carried on racks throughout the operation . . . the process is adaptable to the smallest shop or the largest plant, automatic or manual handling. . . . Let our technicians consult with you.



LO pH HI

NORTHWEST CHEMICAL CO.

9310 ROSELAWN DETROIT 4, MICH.

pioneers in pH cleaning control — serving you since '32

For the very finest . . .

ANODE, SAVER BASKET and DIAPHRAGM BAGS

from Cotton, Nylon and Orlon

Specify **"PARKER"**

If your dealer cannot supply you, address your inquiry to:

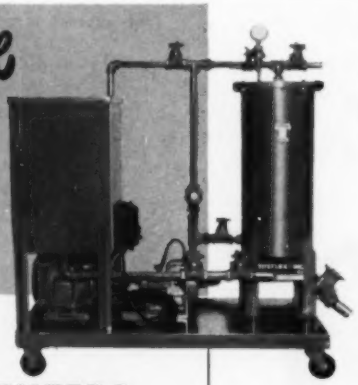
THE WILLIAM PARKER CO.

P. O. Box 209 Worcester, Mass.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 602.

You Save

TIME MATERIALS MONEY



when you use

Titeflex FILTERS

Here's how you Save Time: The Titeflex backwash system cleans out all residue automatically in approximately 20 minutes *without manual labor.*

Here's how you Save Materials: Permanent filtering elements support cake. There is no need for costly replacements such as bags, pads, sheets, etc.

These Titeflex features, plus many others, add up to genuinely efficient *lower-cost* filtration . . . an easier method of handling a difficult mechanical problem. Get the complete Titeflex story!

WRITE FOR FREE CATALOG

Showing sizes, capacities and filtration areas of all Titeflex models.

TITEFLEX, INC.

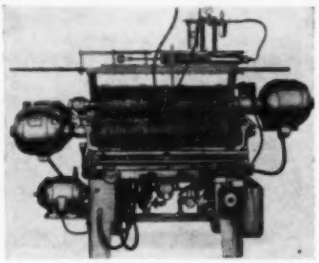
535 FRELINGHUYSEN AVENUE NEWARK 5, NEW JERSEY

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 603.

Equipment and Supplies

and compounds, rust preventives, perspiration and soldering residues, and then deposits a smooth coating of phosphate on the metal surface to provide better adhesion of the finishing material. It can be used in still tanks or power washers. For further information, use Reader Service Card.

E—716. Surface Finishing Machine—Surfaces of either flat or contoured items are said to be finished to any desired degree, from flash removal to mirror finish, by the Model 202 Surface Finishing Machine recently introduced by Clair Manufacturing Company, 1016 S. Union St.,



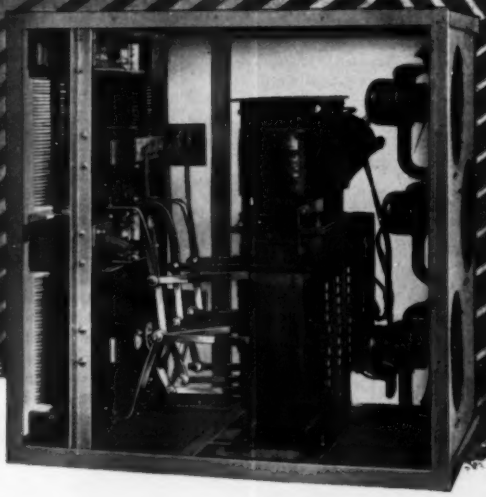
Olean, N. Y. Designed to provide automatic float of buffs at any predetermined uniform pressure, the machine is equipped with two spindles to accommodate rolls 40 inches in width and up to 9 inches in diameter. The automatic hydraulic "in" and "out" stroke is adjustable from 3/8 to 24 inches. A bar mounted across the front serves to open the rolls instantly and arrest all actuation for loading. Optional features include choice of horsepower, variable-speed controls, and automatic cycling devices. For further information, use Reader Service Card.

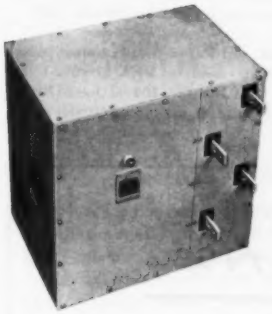
E—717. Leveling Bright Nickel Solution—The Gill Corporation, 5317 St. Clair Ave., Cleveland, Ohio, has developed the Smoothex Nickel Brightener process that is said to assure industry of a fast, low-cost lustrous-nickel plating method.

The organic addition agents are (1) Smoothex No. 400, a primary brightener in powder form; (2) Smoothex No. 50, a secondary brightener in liquid form; and (3) Smoothex No. 200, a wetting agent in paste form that helps to control pitting. By their use in a standard Watts bath, brightness is obtained from the start of the plating cycle, and lustre intensity gains until the maximum brilliance is reached.

The process is claimed unexcelled in line-filling properties. Marks of poor workmanship, flaws in material, or lines left by the polishing wheel are filled in the bath, which can be operated at 5–100

DEPENDABLE RECTIFICATION





FOR NOW—AND FOR THE YEARS

Of course, you *get* reliability when you install Wagner-Tiedeman Electroplating Rectifiers. Models of conservatism, the *proven* DC power source, W-T Rectifiers are deliberately underrated for *safety*, your assurance of full value, continuous efficiency and a long life of trouble-free performance.

But we've given full consideration to the day when replacements may be required at last, due to the day-in, day-out wear-and-tear of grueling service. That's when you discover our parts policy is *unique*. We're continually improving our products; but your W-T Rectifier puts other makes in the "orphan" class—because our engineers see that *these same changes* can be installed in *any* old Wagner-Tiedeman Rectifier. You see, parts are not merely interchangeable; our new developments make your old rectifiers superior in performance to any other make on the market today. Dependable? Yes, for now—and for the years.

On any basis, Wagner-Tiedeman welcomes comparison. Check our fair price; simple installation; low operating cost; infrequent replacement and maintenance; rugged construction and long life expectancy; and, of course, our delivery and service. Range available from 2 to 50 volt; standard: 6, 9, 12, 18, 24 and 48 volt, in blocks of 750 or 1500 amperes.

Wagner
BROTHERS INC.

If you have a power problem, call our Rectifier Department for assistance. We're qualified—and we're just as close as your 'phone. TUlsa 3-0100.

Equipment and Supplies

asf, with ease of control, superior brightness and color, and adaptability to the plating problems of the average job shop. Other baths are easily converted by carbon filtrations, high *p*H treatment, and addition of Smoothex materials. For further information, use Reader Service Card.

E—718. Pocket Size pH Meter—Analytical Measurements, Incorporated, 585 Main St., Chatham, N. J., offers a pocket-

size *p*H meter and companion probe unit for on-the-spot *p*H determinations.

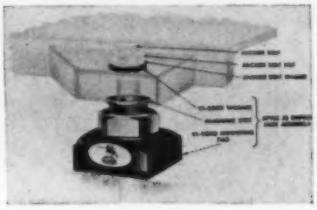
Completely self-contained with batteries, in a Bakelite case 3 x 5¾ x 2½ inches, this instrument is furnished, camera fashion, with plastic tubes of buffer and KCl solutions. The 3-lb case comes with a combination hand-and-shoulder strap, leaving both hands free. Supports and beakers are eliminated by combining the calomel and glass electrodes with the 0.5-ml sample holder in a single polyethylene probe unit. The meter is scaled from 2 to 12 *p*H for easy reading, and a simple adjustment gives readings from 0 to 14. Accuracy of 0.1 *p*H is obtainable. For further information, use Reader Service Card.

E—719. Silver Plated Steel Wire and Rod—Kenmore Metals Corporation, 380 Ninth St., Jersey City 2, N. J., announces the development of a new continuous process for rapid electroplating of silver on steel wire and rod at a cost comparable to that of nickel or brass plated material. Improved methods and precise process control are said to permit the use of unusually small amounts of silver for a durable, decorative finish.

It is suggested that manufacturers of television antennas, coat hangers, woven-wire products, toys, bird cages, curtain rods, dish strainers, lamp-shade forms, fan guards, potato mashers, paper clips, and other consumer items will be able to offer the public a silver-plated product. For further information, use Reader Service Card.

E—720. Leveling Jack—A newly designed EMPCO Leveling Jack has been announced by the Enterprise Machine Parts Corporation, 2731 Jerome Ave., Detroit 12, Mich. The Style JS jack, available in 3 heights, will support 20 tons and lift 8,000 pounds without overexertion on the wrench.

To compensate for uneven floors, the top of the lift screw has a concave spherical radius into which glides the convex spherical radius on the bottom face of the aligning disc. This permits sufficient float for the level alignment of machine while insuring maximum bearing. Vi-Sorb mounting pads, developed to reduce machine maintenance costs due to vibration, are available and are cut to fit the



under-part of the jack base. For further information, use Reader Service Card.

E—721. *p*H Paper—A *p*H testing paper, "Oxyphen" is offered by J. Einstein Company, P. O. Box 148, 108-03 Queens Blvd. Forest Hills, N. Y., for quick and exact

Serving the Cleveland Area

EQUIPMENT AND SUPPLIES
FOR
PLATING AND POLISHING

• • •

PLATERS SUPPLY COMPANY

2059 HAMILTON AVENUE
CLEVELAND 14, OHIO
TOwer 1-6670

RESIN-BONDED FIBERGLAS®

PLA-TANK®

This 24-foot Beetle Boat cabin cruiser is a seamless, one-piece sea-going beauty that will never need caulking, painting or scraping — will not corrode, rot or be eaten by worms. Made of Fiberglas impregnated and bonded with polyester resins, it is the $6500 granddaddy of PLA-TANK.

The Ideal Plating Tank Which Replaces Critical Materials!

PROVED IN THE FIELD

PLA-TANK has been field-tested in several hundred installations and proved to be an exceptional and practical material for plating room tanks.

Newest data sheets now list many common acids (hot or cold), plating solutions, bleaches, solvents, bright nickels and zinc dips which can be used safely with PLA-TANKS.

In many instances you can substitute PLA-TANK for stainless steel, rubber- or plastic-lined tanks, crocks or acid-proof stoneware. Physically, PLA-TANK is virtually indestructible.

PLA-TANK IS MADE RIGHT

The engineering know-how of metal-finishing men at Chemical Corporation and the construction skill and facilities of Beetle Boat Company have combined to bring you PLA-TANK, the original resin-bonded Fiberglas tank.

READILY AVAILABLE — PRICED RIGHT

In standard sizes, delivery of PLA-TANK is less than a week; in special sizes, only a little longer!

PLA-TANK cost is moderate, usually less than other materials it replaces. Holes for fittings may be drilled as required; overflow dams can be molded right into the one-piece construction. Suitable reinforcing ribs are included on larger panels as required.

MAIL COUPON TODAY FOR FREE DATA

Send the coupon today for Test Data Sheet, Size and Price Chart on PLA-TANK — the ideal plating tank that you can get — NOW!

THE *Chemical* CORPORATION

57 WALTHAM AVE., SPRINGFIELD 9, MASS.

THE CHEMICAL CORPORATION
57 Waltham Ave., Springfield 9, Mass.

Please send me test data and size and price information on PLA-TANK resin-bonded Fiberglas plating tanks.

Name .....

Firm .....

Address .....

EQUIPMENT

is our BUSINESS

PLATING

from your smallest requirement to complete installations.

POLISHING

from a small polishing lathe to a straight-line or rotary full automatic.

Our years of practical experience in planning and engineering are yours for the asking. No obligation, of course.

The GILBERT TRAMER Co.

POLISHING • PLATING SUPPLIES • EQUIPMENT

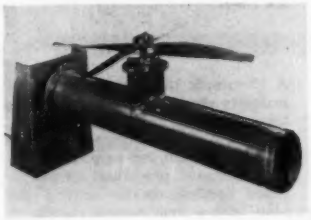
402 SWETLAND BLDG., CLEVELAND 15, OHIO

measuring with wet comparison colors instead of dry-comparison colors. Indicator and comparative colors are on the same strip. For further information, use Reader Service Card.

E—722. Anodizing Basket—Production anodizing of rivets and other small parts at low cost is provided by an anodizing basket announced by the Belke Manufacturing Company, 947 N. Cicero Ave.,

Chicago 51, Ill. Designed for use in sulfuric acid solutions, the basket is made of bakelite with an aluminum center stem. The cover is equipped with a compression spring for maintaining the positive contact pressure essential to uniform anodizing results. The basket illustrated is 12½ inches by 5¾ inches ID; other sizes are furnished to specifications. For further information, use Reader Service Card.

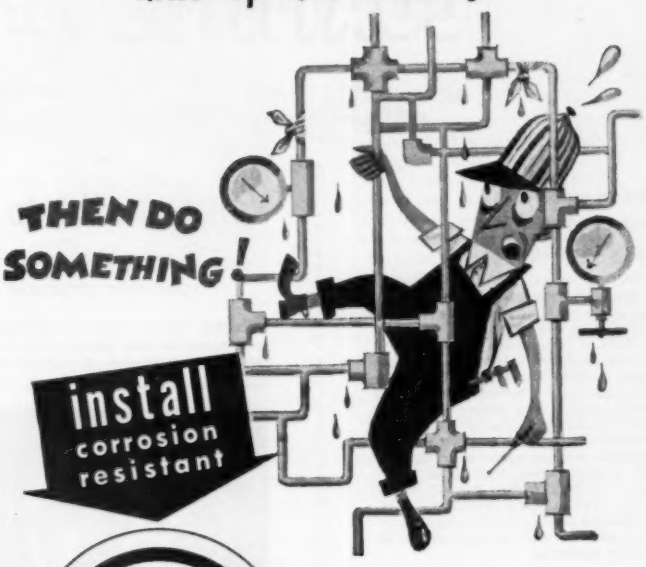
E—723. Fan for Sulfuric Acid Fumes—International Engineering, Inc., Day-



ton, Ohio, has developed an exhaust fan designated specifically for handling sulfuric acid fumes from pickling operations. Constructed of the new Carpenter Stainless No. 20, the unit is said to give many times the useful service life of fans made from other materials at temperatures up to 176° F. For further information, use Reader Service Card.

E—724. Cement for Polishing Wheels and Belts—A new type abrasive bond for many types of industrial polishing belts and wheels is offered by D. & H. Scovil, Inc., Higganum, Conn. It is said

Frantic
about pipe repairs and replacements?



SARAN LINED steel pipe

Now, more than ever, it's important that you get dependable, long term service from your equipment. "Downtime" is costly—replacements aren't always available. To assure yourself of uninterrupted production, install saran lined steel pipe now! In addition to the excellent corrosion resistance of this remarkable pipe—you have the plus values of rigidity, pressure strength and ease of installation, requiring NO special tools. These advantages are all important to you in the reduction of shutdown time and equipment replacement. For full information, mail coupon to The Saran Lined Pipe Company. *Saran lined steel pipe is manufactured by The Dow Chemical Company.*

Distributed by
Saran Lined Pipe Company
2415 BURDETTE AVE. • FERNDALE, MICHIGAN
Offices in: New York • Boston • Philadelphia • Pittsburgh • Chicago • Tulsa • Portland • Indianapolis San Francisco • Houston • Denver • Seattle Los Angeles • Cleveland • Charleston, S. C. • Toronto

send today!

Please send me your catalogue containing detailed information on Saran Lined Pipe, Valves and Fittings.

NAME_____
TITLE_____
COMPANY_____
ADDRESS_____
CITY_____
STATE_____
SP-52

SARAN LINED PIPE
a
DOW
product

News about UNICHROME Trade Mark COATINGS for METALS

How to continue chromium plating of zinc die castings

If you can't use copper and nickel, you can plate chromium directly on zinc die castings. When plated directly on castings, the chromium is usually gray and dull, but brightness can be brought up by buffing. You'll find direct chromium plating a practical operation on simple, easy-to-buff shapes—especially with Unichrome S.R.H.S. Chromium Solution which plates brighter on castings than ordinary chromium baths.

A deposit thicker than usual is required to avoid buffing through to the base metal. And baking on of Unichrome Coating B-115 is highly recommended for extra protection against dulling in service.

Yes . . . rack coating helps you conserve

Don't overlook the sizable contributions toward conservation of labor and materials made by a superior rack coating such as Unichrome Coating 218X. By its ability to maintain a smooth, free-rinsing, damage-free surface in all baths, it not only requires less maintenance, but also reduces contaminatory drag-in and wasteful dragout of plating metals.

Electrolytically-produced conversion coating speeds parts for defense

Like anodizing, the Anozinc* process for zinc plate uses current to form a tougher and more corrosion resistant finish. It dovetails with the zinc plating set-up, permitting fast, continuous processing of such parts as shell casings, die castings and propeller blades.

* Trade Mark

You can still do BRIGHT FINISHING

Here's how to keep on giving many consumer products sparkling chromium plate

Whether you are able to use copper and nickel or not, you can turn out bright metal finishes. If you can undercoat with these metals, be sure to follow up with Unichrome S.R.H.S. Chromium Plating for time- and money-saving advantages. If you can't use copper and nickel, then you still have available one of the following ways to finish:

Chromium plate, even without copper or nickel undercoatings, can be used effectively on straight chromium stainless steel. So if you can make your product from stainless, consider plating it directly in Unichrome S.R.H.S. Chromium Solution.

Unichrome S.R.H.S. Chromium needs no nickel strike on stainless. Moreover, this bath deposits its chromium 20 to 80% *faster*. It plates bright over a wider range of current densities. A self-regulating bath, it requires less supervision to keep in peak plating balance.

A LITTLE ZINC GOES A LONG WAY IN BRIGHT FINISHING

A bright finish that looks like chromium is easily obtained by zinc-plating steel products and then processing them in Unichrome Clear Dip. You don't need much of a zinc deposit either. A supply-stretching .0003" of plate is ample. Thus, pound for pound, you can plate *more* products than with other finishes, and save money besides.

The Unichrome Dip Finish resists corrosion, stays bright. It has been used for several years on ice skates, bicycle parts and refrigerator shelves. A still higher quality finish will be assured by applying a clear synthetic coating such as Unichrome Coating B-115 over the Clear Dip Finish for extra protection.

INDOOR OR SHELTERED APPLICATIONS

A 10-minute plate of chromium on ordinary steel, especially when you take advantage of the faster rate of deposition of the Unichrome S.R.H.S. Chromium Bath, can be given excellent corrosion protection for unexposed applications by coating the plate with a clear organic coating. A tough, flexible baking synthetic, Unichrome Clear Coating B-115 has been used for years because of its outstanding adhesion to chromium, its non-yellowing clarity, and its corrosion resistance.

UNICHROME Trade Mark

UNITED CHROMIUM, INCORPORATED

100 East 42nd St., New York 17, N. Y.
Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif.
In Canada:
United Chromium Limited, Toronto, Ont.

to have 5–20 times the life of competitive materials and to be reapplied for about half the cost of replacing best grade single-use belts. Based on Vinylite resins, it is resistant to moisture, mould and mildew, and does not require lubrication in most cases. Used belt surfaces are first washed and the belt restretched to proper lengths. Two coats of the bond are then applied, and the grain or abrasive sprinkled on the belt surface. Coarse-grained abrasive is forced into the belt surface with at least 5 lb pressure. Two final coats of bond are then applied at intervals. For further information, use Reader Service Card.

E—725. High Speed Recorder—An electronic high-speed pen recorder for measuring rapidly changing variables experienced in laboratory and test application has been developed by Minneapolis-Honeywell Regulator Company, Brown Instruments Division, Wayne and Windrim Aves., Philadelphia, Pa.

Full-scale signals which vary as rapidly as 20 cycles a minute can be recorded, also those with peak-to-peak amplitude of 10 per cent of scale which vary as rapidly as three cycles a second. For further information, use Reader Service Card.

E—726. Wet Blaster—Fast, economical and uniform high-luster finishes on all types of metal parts and tools are claimed for a new low-cost, bench-model wet blaster called the Cro-Hone, Jr., manufactured by the Cro-Plate Company, Inc., 747 Windsor St., Hartford, Conn. It

uses a fine abrasive suspended in a water carrier which is forced against large or small metal parts by air pressure through a siphon jet gun.

Of full stainless steel construction, the unit has no moving parts or circulating pumps. In operation, the metal parts to be finished are inserted through the front window door. All openings are fitted with splash-proof guards, and all controls are located within easy reach on the side of the cabinet. The large, clear-view window enables the operator to watch progress of the work. A blower clears away the abrasive splash so that vision is not obscured. The work is held in one hand, the easily manipulated gun in the other.

A removable filter makes cleaning and changing of the unit simple. All that is needed for immediate operation is a 3/8-inch air connection and a ½-inch water connection. For further information, use Reader Service Card.

E—727. Fine Grain Copper Alloy Products—The American Brass Company, Waterbury 20, Conn., recently announced the development of "Formbrite" copper-alloy sheet, strip, wire, rod and tube. A special procedure of rolling or drawing and annealing brass containing 63–90 per cent copper produces exceptionally fine grain size (about 0.008 mm).

Physically the metal is stronger, harder and "springier" than ordinary drawing brass, yet it retains remarkable ductility for deep drawing, forming and cold upsetting. The fine grain structure is said to provide metal with a surface so smooth that a simple buffing operation produces a lustrous finish. Many reports from the field indicate that where parts are to be plated, or even buffed or lacquered, Formbrite effects substantial savings in finishing costs. For further information, use Reader Service Card.

VENTEX*

Buffing Wheels

*The VENTILATED Buff

by The Textile Buff and Wheel Co.

Inquiries solicited on our full line of Buffing Wheels

The TEXTILE BUFF and WHEEL Company

64-80 VALE STREET • CHELSEA, MASSACHUSETTS

YOU CAN'T AFFORD TO GAMBLE AT HIGH PRODUCTION RATES

This new high-speed automatic plating line plays it safe with PENNSALT CLEANER

Plating that's bright, that won't blister or peel . . . is a "must" for household appliances. To get such results on a high-production line . . . all the time, with every unit . . . requires fast, efficient metal cleaning prior to plating.

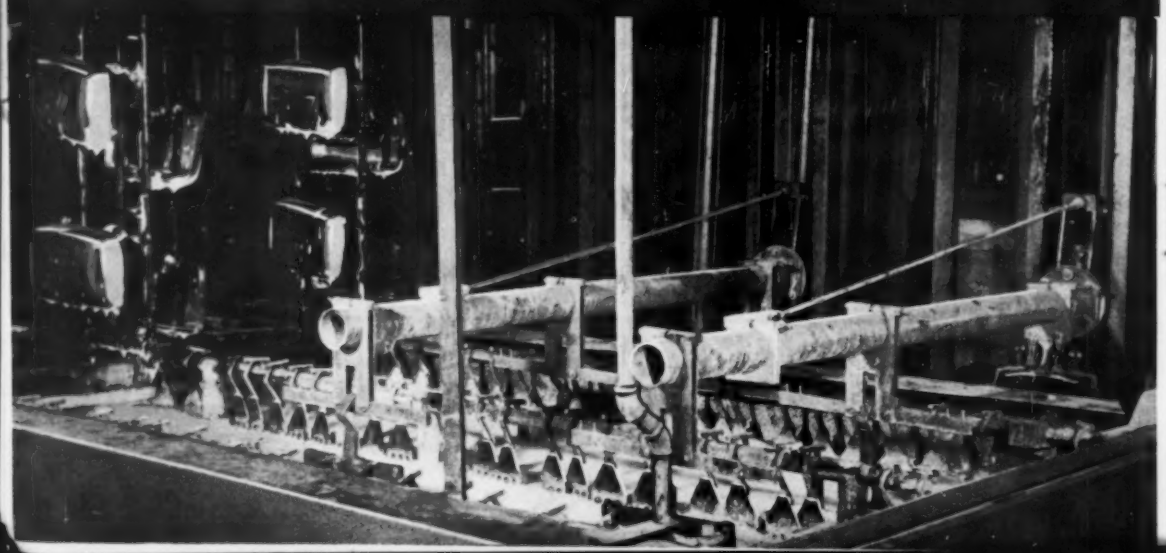
That's why a major appliance manufacturer uses a Pennsalt Metal Cleaner in the new plating installation shown here. Months ago, plating experts put this Pennsalt Cleaner through rigid tests.

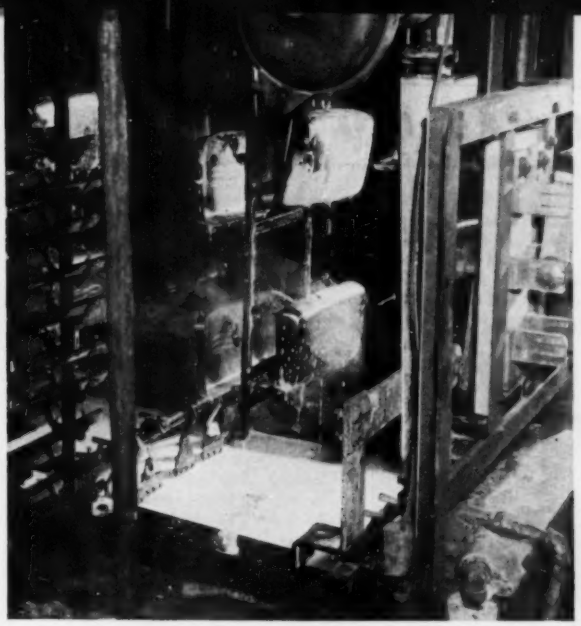
Here are three big reasons why they've used it ever since . . .

1. **Practically no rejects to tie up production.** Technicians found that they could hold rejects, caused by spotting or "color," down to an absolute minimum. Pennsalt Cleaners do the job *right*.
2. **Rock-bottom cost per unit cleaned.** On this new installation, platers dump tanks only once a month or less . . . real economy! Pennsalt Cleaners make a long-lasting, uniform solution *every time*.
3. **Superior all-around performance.** This line achieves highly efficient, fast, trouble-free operation. Pennsalt Cleaners have been scientifically developed to meet actual plant conditions.

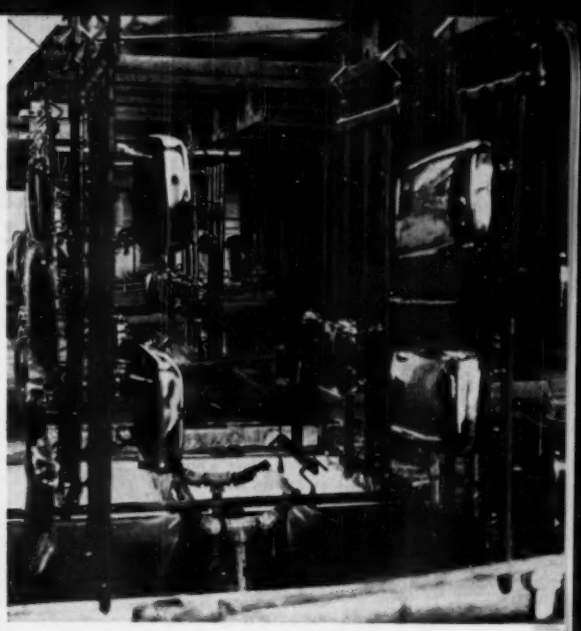
No wonder plating men have confidence in Pennsalt Cleaners! They get the benefits of Pennsalt's long experience in the metal cleaning field. You can, too.

Write today for further information to:
Industrial Chemicals Department, Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa.



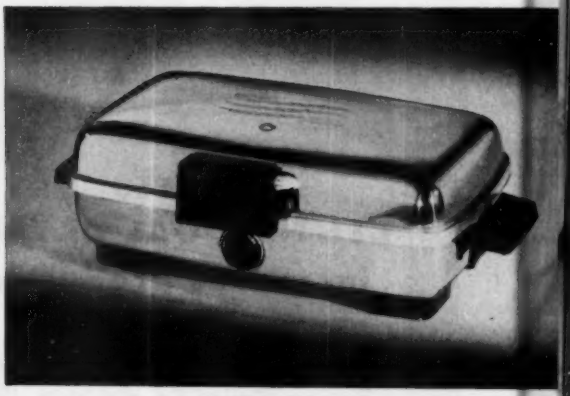


2. *Second cleaning of shells* prior to nickel plating. (Anodic, 10 sec., 6 v., 12 to 14 oz. Pennsalt Cleaner per gal.)



3. *After nickel plating* and buffing, shells get another Pennsalt cleaning bath prior to chrome plating.

4. *Inspection by experts* after chrome plating. Bill Lindsay (left), Pennsalt service representative, confers with plant supervisor and plater.



5. *Finished product gleams* with bright chrome plating. Pennsalt Cleaners helped produce this brilliant sandwich grill and waffle iron.

4 BASIC REASONS WHY THE ELECTROPLATING INDUSTRY HAS CONFIDENCE IN PENNSALT

HIGH QUALITY. You're sure of high quality when you buy from Pennsalt. The finest raw materials, rigid product specifications and modern manufacturing equipment guarantee it.

LOW COST. You get the benefits of large volume manufacture. And you don't pay "middle man" charges. As a basic producer, Pennsalt controls the manufacture of most of its products from raw material to finished form.

INTENSIVE RESEARCH. By improving our products, we often help to improve your methods. You obtain higher efficiency in your operations. Pennsalt scientists work day in and day out to develop better products, better methods.

PROMPT FIELD SERVICE. Our representatives are trained to know your problems—and can frequently show you savings in time and money. They back up every sale. They're at your service whenever you need help.

PENN SALT
metal cleaners

Remember the A.E.S. Convention
Buffalo, N. Y., July 30-August 2

PROGRESSIVE CHEMISTRY FOR OVER A CENTURY

THE MAILBOX

Subject: Tin Plating

DEAR SIR:

We were very interested in your excellent, timely editorial on "Tin as a Substitute for Other Plating Metals". In this editorial you mention that tin coatings are highly receptive to soldering. Whereas we believe this statement to be true, it is subject to the limitation that storage of parts coated with electrodeposited tin has an adverse effect on the solderability of this coating. This effect is especially troublesome where a noncorrosive flux, such as a rosin flux, is used. Two published articles will illustrate this point:

L. H. Seabright, "Solderability of Lead-Tin Alloy Plating", Iron Age, December 8, 1949.

D. Wallace, "Metal Coatings Improve Solder Flow on Steel and Brass", Materials & Methods, May, 1949.

It has been found that an electrodeposited lead-tin alloy of approximately eutectic composition overcomes the adverse effect of storage. This coating is being used on parts where excellent solderability is demanded even after lengthy storage periods. Another use of the alloy-plating solution is to electrodeposit solder on parts which are then assembled together by heat-fusion of the deposits. Assembly in this fashion has eliminated or greatly reduced the amount of hand soldering required.

Very truly yours,
CLIFFORD STRUYK

Subject: Waste Recovery

DEAR SIR:

The article by Neben and Swanton on "Recovery of Chromic Acid from Plating Rinse Water" in the May, 1951 issue is very interesting and informative in bringing out the cost of plating solutions.

However, it should be pointed out that many bright-nickel solutions are considerably more expensive than the nickel solution indicated (59 cents/gal). For example, the cost of one bright-nickel solution containing 40 oz/gal nickel sulfate, and 8 oz/gal nickel chloride, including boric acid and brighteners, was computed at $1.23/gal when the cost of purification was added. The expensive purification is not necessary for chromic acid solutions.

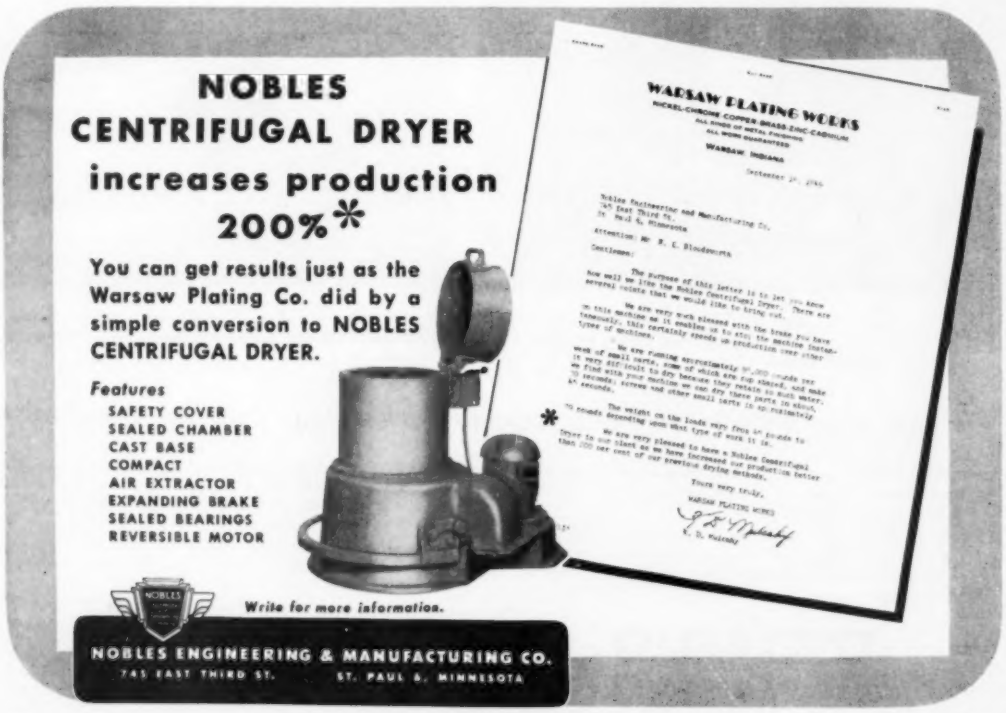
Is it not obvious to every plater that he is losing expensive nickel solution in the rinse as it is in the case of chromium where parts per million are visible.

Yours truly,
F. X. MCNALLY

DEAR SIR:

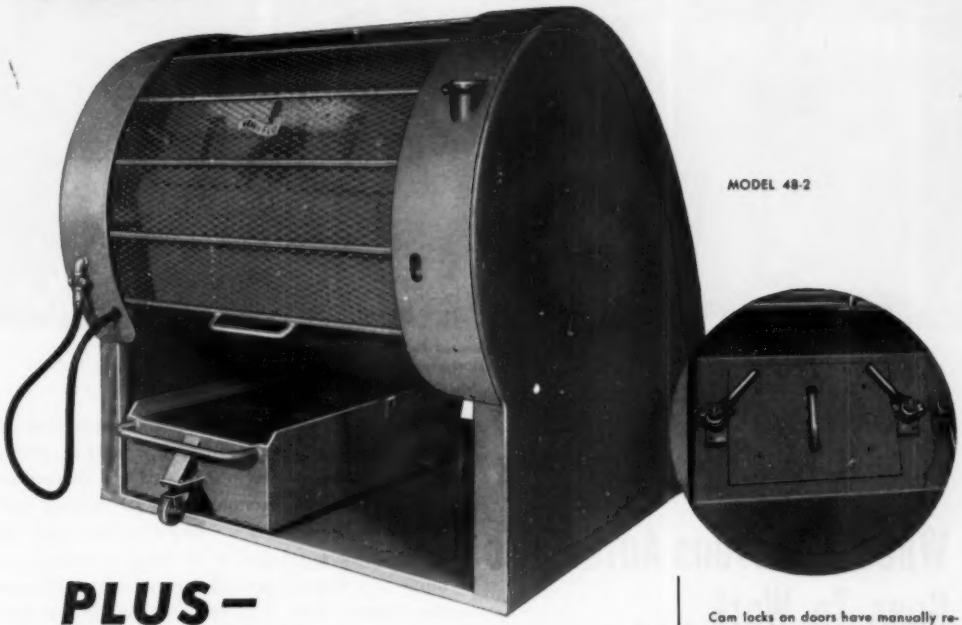
Mr. McNally's point that bright-nickel plating solutions may be more costly than chromium plating solutions is well taken. The thinness of chromium deposits relative to nickel deposits, however, probably still leaves chromium rinse waters a more attractive recovery potential. Nevertheless, platers would do well to consider the recovery of nickel from rinse waters; in fact, this problem is now under consideration for commercial installations. With proper cleaning precautions, the equipment used for chromic acid recovery could be used to solve the nickel problem.

Cordially,
The Pfaudler Co.
E. W. NEBEN



31% to 80% MORE WORK-LOAD-

than comparable tumbling machines occupying the same floor space!



MODEL 48-2

PLUS—

a 15% to 25% shorter cutting cycle!

Grav-i-Flo Tumbling Machines are designed to produce more work in less floor space. That's why so many companies have chosen Grav-i-Flo to handle all their tumbling needs. These manufacturers have compared Grav-i-Flo to other tumbling machinery and have found—First: that Grav-i-Flo machines, in each model, occupying the same floor space, have a 31% to 80% greater capacity; Second: that Grav-i-Flo machines cut from 15% to 25% faster; Third: this shortened processing cycle permits reduction in the required number of machines for an installation, thus benefiting capital investment, floor space and production time; and, Fourth: Grav-i-Flo tumbling machines in all models have such exclusive features as advanced design on door locks and safety guards, and cylinder removal for easier maintenance.

Cam locks on doors have manually released safety stops for pressure relief.

New Grav-i-Flo machines available in a number of models to meet all tumbling requirements. Compartments furnished ½" plate unlined or ¼" plate rubber lined. Reduced voltage control on magnetic starter. Lever or push-button switch. Limit switch on safety guard. 220-440 volt, 3 phase, 60 cycle motor with magnetic brake. Water attachment with hose. Counterbalanced safety guard. Hoist pan has tubular yoke with manually operated lock.

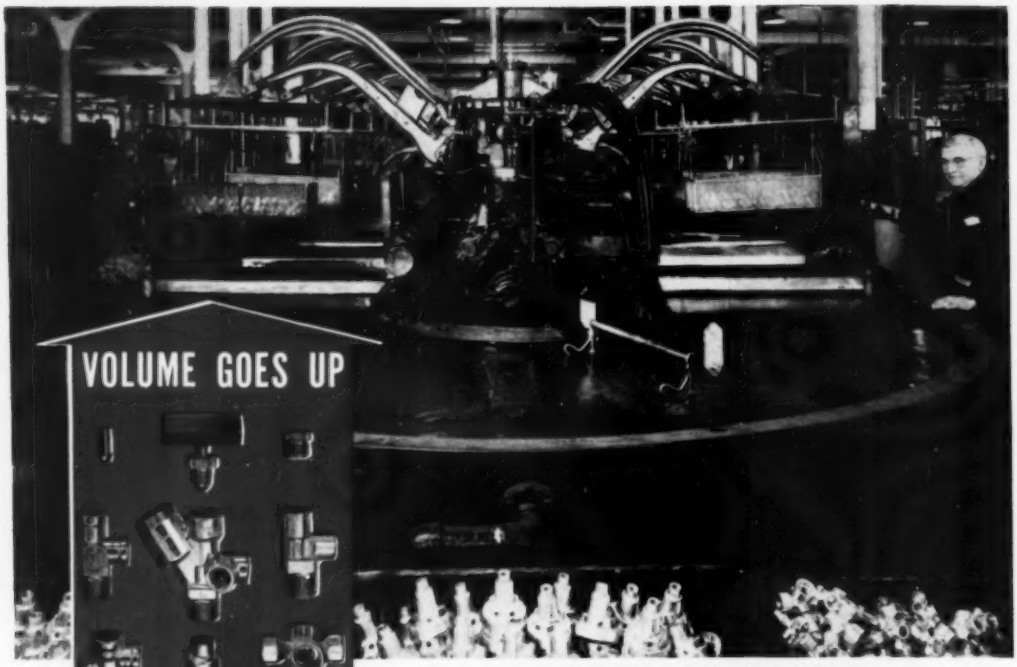
TUMBLE GRAV-I-FLO FINISH

Motor Driven Separator—welded frame supports hoist pan. Separating screen, adjustable from 0" to 1½", accomodates various sizes and types of parts. Screen inclined 5° maximum. Pan shelf provided for stock pan. 1 H.P., 220-440 volt, 3 phase, 60 cycle motor with speed reducer, and manual starter with overload protection.

Samples Processed Free! The Grav-i-Flo Sample Processing Department will gladly tell you how to attain a better finish at lower costs. Send samples direct to The Grav-i-Flo Corporation.

THE GRAV-I-FLO CORPORATION

Dept. P-7, 400 Norwood Ave., Sturgis, Michigan



Stevens Full Automatic at Bastian Blessing's Chicago plant used for processing valve parts shown in inset.

When a Stevens Automatic Goes To Work . . .

Look at the results reported by The Bastian Blessing Company of Chicago, after installing a Stevens Special Full Automatic Bright Dipping Machine!

E. N. Krein, vice president, says: "Although our Stevens Machine has been in operation only three months, it has demonstrated its advantages in so many ways that *we wish to confirm the claims made by Stevens about this equipment!* Parts sent through this machine without prior cleaning come out *dependably and uniformly bright and free from grease, dirt and chips.* We have *increased our volume and reduced our unit costs* on our bright dipping operations. The installation is doing a big job in this day of labor shortages and it is doing it without the fumes and personal protective equipment of the past. Our records show that the workmen appear quite pleased and it looks like we will have less labor turnover in this work."

There you have the word of a satisfied customer —the best endorsement of all. Why don't you let your Stevens representative show you how Stevens equipment can bring new profit and economy to *your* operations? Call him today or write direct to *Frederic B. Stevens, Inc., Detroit 16, Michigan,* for complete information. There's no obligation.

METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. STEVENS INCORPORATED

DETROIT 16, MICHIGAN

plating

JULY, 1951 VOL. 38, No. 7

Contents

The Problem of Painting Bright Chromium Plate 696
Wardley D. McMaster

Colorimetric Determination of Zinc and Cobalt in Gold Alloy Plating Solutions 699
J. Mermillod

Plastic Deformation of Chromium Plated Steel 701

How Strong is that Waste Solution? 703

Washington Orders 704

Rack Making 709

Cleaning and Preparation of Metals for Electroplating. III. Degreasing Evaluation Tests: The Atomizer Test 713
Henry B. Linford and Edward B. Saubestre

Dr. Blum Honored 717

Thirty-eighth Annual Convention Program 721

Annual Reports of A. E. S. Officers 731

Sustaining Membership List 742

Monthly Features

Industry News 626

Personals 648

Trade Literature 658

Equipment and Supplies 672

Mail Box 690

Editorial 695

Book Review 718

Question Box 718

Article Abstracts 746

Patent Abstracts 752

A. E. S. News 764

I. F. C. News 765

Branch News 766

A. E. S. Directory 778

Advertising Index 785

Future Meetings 786

Staff

Managing Editor
DR. A. K. GRAHAM

Editor
K. G. SODERBERG

Assistant Editor
DR. H. J. READ

Editorial Board
Dr. W. R. Meyer, Dr. E. A. Parker, Dr. R. B. Saltonstall, Dr. R. A. Schaefer, J. M. Andrus, E. T. Candee, B. C. Case, M. B. Diggin, M. Glover, G. W. Jernstedt

Advertising
W. C. DIETRICH, *Manager*
LEE F. O'CONNELL, Western Representative (111 N. La Cienega Blvd., Beverly Hills 48, Calif.; 544 Russ Bldg., San Francisco 4, Calif.)

Production Manager
M. K. DICKINSON

Published by the American Electroplaters' Society at 5800 N. Marvine Street, Philadelphia 41, Pa. Editorial, Advertising and Executive Offices: 473 York Road, Jenkintown, Pa. Phone: Ogontz 9650-1. Subscriptions: Domestic and Canada, $4.00 for 1 year, $7.00 for 2 years; 50c per copy; Foreign, $8.00 per year; $1.00 per copy.

Copyright, 1951, by the American Electroplaters' Society.

PLATING is abstracted regularly in Chemical Abstracts, Engineering Index, Technical Data Digest and Bulletin Analytique.

Harshaw

cadmium fluoborate plating solution

ADVANTAGES

1. Simple make-up and control
2. High plating speeds
3. Anode and cathode efficiencies approximately 100%
4. Decided reduction of hydrogen embrittlement of hardened steel

SOLUTION COMPOSITION (TYPICAL)

Cadmium Fluoborate Cadmium	32 oz/gal
Free Boric Acid	12.5 oz/gal
Ammonium Fluoborate	3.0 oz/gal
Addition Agent	8.0 oz/gal
	As required

OPERATING CONDITIONS

pH (Colorimetric)	4.0—5.0
Temperature	75°—100° F
Current Density	20—70 AMP./sq.ft.
Agitation	As required (mechanical or air)

BATH MAKE-UP

Bath prepared by dilution of concentrate, containing about 42 oz/gal Cadmium, then adding Ammonium Fluoborate as indicated. The pH is raised with Ammonia Water or lowered with Fluoboric Acid.

EQUIPMENT

Tanks: Rubber lined steel or approved synthetic materials
Barrel Cylinders: Bakelite or hard rubber.

THE **HARSHAW CHEMICAL** CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

● For prompt action contact the Harshaw Sales Office nearest you: 505 North La Salle St., Chicago 10, Ill. ● 611 American Bldg., Cincinnati 2, Ohio ● 1945 East 97th Street, Cleveland 6, Ohio ● 9240 Hubbell Ave., Detroit 28, Mich. ● 6622 Supply Row, Houston 11, Texas ● 3237 South Garfield Ave., Los Angeles 22, California ● 420 Lexington Ave., New York 17, New York ● Jackson & Swanson Sts., Philadelphia 48, Pa. ● 7th and Carson Sts., Pittsburgh 3, Pa.

Editorial

Give Me A Good Reason

MOST PLATERS who have gone to a Convention of the American Electroplaters' Society return year after year and will undoubtedly show up in Buffalo between July 30 and August 2. Those who have not, and they include over 600 new members, may wonder why they should go.

The best reason, we believe, is the opportunity to meet fellow platers from other parts of the continent. The Midwesterner has much to learn from the Easterner and vice versa, and the Westerner and Southerner can acquire knowledge from both. And there is more to be had than factual information: ways of looking at things, for example; and friendships to draw upon when needed. The entertainment program at the Convention serves this general purpose, to bring people together.

Another excellent reason is the technical program. It too will supply facts and viewpoints useful for today's needs. It will also introduce leaders in many fields and furnish occasions to meet them.

A third reason, perhaps not so obvious, is the opportunity to learn how the A. E. S. functions. The Society has played an important role in the growth of the electroplating industry and unquestionably is slated to influence future developments to an even greater extent. Important decisions are to be made at the Annual Meeting held during the Convention, which in the long run will affect every plater.

Good reasons, yes. Come to Buffalo!

Gustaf Soderberg

THE PROBLEM OF PAINTING BRIGHT CHROMIUM PLATE*

WARDLEY D. McMASTER

Assistant Head, General Chemistry Department,
General Motors Research Laboratories, Detroit, Mich.

Introduction

The problem of securing satisfactory adhesion of enamel to chromium plate became critical during the period 1934–1937, with the increased application of plated parts accented with colored enamel. Because it was at first customary to apply the enamel to small recessed areas in the design, the painted area was well protected and adhesion was not a critical problem. The decorations, however, grew more extensive in area, and protection by raised boundaries was frequently omitted. This resulted in peeling of the enamel from surfaces that were important from the standpoint of decoration and identification.

The first studies of the problem were based on humidity exposure tests. Many production parts blistered in the painted area and lost adhesion. Previous work on paint systems had shown that field complaints were not received if parts would withstand a 24-hour humidity exposure at 100° F (38° C) and 100 per cent relative humidity or a water-soak test of 2–4 hours at 100° F (38° C).

When failures by blistering occurred under these test conditions, it was ascertained that they were due either to quite thin films which permitted excessive penetration of moisture, or to a lack of cleanliness of the metal before painting. Some failures were still obtained after these conditions had been corrected. A variety of paints were tried, sometimes with apparent success, but soon failures were again found.

Inasmuch as the adhesion of a synthetic enamel can be improved by more thorough baking, an increase in temperature was tried with apparently good results, but failures were soon in evidence again. It was decided that the uncertainty of results must be due to the fact that the parts themselves were not uniformly conditioned. Moreover, the increased bakes were not desirable where so much of the plating was done on zinc-base diecastings.

Some consideration was given to the possibility that the different makes of enamel being applied to the parts in question were responsible for differences in adhesion. It was found, however, that there was no uniformity from part to part in the adhesion of the different makes of enamel.

The foregoing results left the preparation of the surface to be painted as the only factor not fully investigated. Prior to 1928, much difficulty in service was experienced with painted sheet metal. It was cleaned with alkali in hot water and double-rinsed, but traces of alkali or salts in the rinse water remained on the surface of the metal and caused blisters. These blemishes, because of their outlines, were known as "water spots" or "worm tracks". It was felt that a rinse with a very weak acid, such as phosphoric, might serve not only to neutralize any alkali but also to convert the active salts to less active ones. After considerable experimentation, it was determined that a single rinse in 0.02 per cent phosphoric acid by volume would completely eliminate any tendency to develop blistering. In the light of this experience it was only natural to make a similar attack on the new problem.

Experimental Methods

The humidity test consists of exposure in a room held at 100 ± 2° F (38 ± 1° C) for 24 hours. The relative humidity is 100 per cent as determined by gravimetric analysis or by the better dew-cell instru-

TABLE I. CRITERIA FOR ADHESION RATING

Description of Film Behavior	Adhesion Rating
Breaks, does not peel	Good
Peels to a point and breaks within ¼ inch	Fair
Peels between cuts over ¼ inch	Poor
May be lifted from an area about the cut with point of knife	Fail

*In this article, the words "paint" and "painting" are used to include all organic coatings and their application. Lacquer, enamel and paint have become nearly indistinguishable as far as basic formulation is concerned. "Bright" chromium plate includes both bright-as-plated and color-buffed chromium.

TABLE II. EFFECT OF PRETREATMENTS ON ENAMEL ADHESION TO CHROMIUM PLATE

Treatment	Adhesion Rating After Humidity Exposure	
	Without Condensation	With Condensation
No treatment; as received	Fair	Poor
Clean with lacquer thinner	Good	Poor
Chromic acid dip, 1 minute	Good	Good
Alkali clean plus chromic acid dip	Good	Good
20 per cent by vol phosphoric acid-alcohol-water solution; dry wipe	Fair	Very Poor

ments now available. The samples are placed on a shelf below a ceiling area that is not well insulated; hence, occasional drops of water fall on the area being tested, insuring reasonable wetness. A standard reference item is included in all tests, although results are gratifyingly uniform.

Adhesion is tested by using a moderately sharp knife to make parallel cuts 1/16–3/32 inch (1.6–2.4 mm) apart. These cuts must reach the metal at all points. One end of the paint strip is separated from the metal with the knife, then held between thumb and knife blade and peeled from the surface without bending the strip too sharply or exerting appreciable tension. Table I and Fig. 1 show the ratings used. It is necessary that the film itself be of sufficient thickness and strength to permit such a test. Films of from 1 to 2.5 mils (25 to 65 μ) are satisfactory; however, the adhesion of films too thin for the normal test *may* be estimated by a scrape test in direct comparison with an unexposed film. Extremely thin films may be completely disrupted by the exposure test.

It has been mentioned that production parts vary in their reaction with the paint film, and it should be reiterated that thorough cleaning was not a solution to the problem and that a part might be painted, baked, solvent stripped and re-painted without improving the adhesion. It was therefore a simple matter to select for test purposes parts that would produce uniformly poor adhesion of the enamel when not specially treated.

Experimental Results and Discussion

Several preparatory treatments were tried on a number of emblems. After the treatments, the emblems were sprayed with the same enamel, baked 1 hour at 200° F (93° C), cooled, checked for adhesion, and then exposed in the humidity room for 24 hours. The different treatments and the results obtained from them are summarized in Table II.

It is evident that the phosphoric acid-alcohol-water treatment leaves an objectionable residue.

The present trend of supplying chromium plate directly on copper without the use of nickel suggests the warning that neither a phosphoric acid rinse, nor the chromic-phosphoric rinse substituted for chromic rinses during the last war, may be used safely to treat such parts at temperatures exceeding 80° F (27° C). The higher temperatures induce a reaction with the copper which results in the appearance of "copper bleeding". Complete overcoating of these plated parts with a clear synthetic enamel (varnish) is now being resorted to in order to inhibit copper bleeding due to reaction with the H_2S or SO_2 fumes found in industrial atmospheres.

Considering that production parts come out of a chromic acid bath, one might assume that any further treatment involving chromic acid would be superfluous, yet the added rinse appears to be the answer to the problem. Later studies have clearly shown that the chromic acid rinse must be uncontaminated, and that the parts must not be rinsed with plain water after the chromic acid rinse. A hot chromic acid rinse is preferable from the standpoint of drying.

The concentration of chromic acid in the rinse was

Fig. 1. Patterns for ratings in adhesion test

investigated over a wide range, and the possibility of using phosphoric acid in place of chromic acid was also considered.

The results, as shown in Table III, suggest the need for a complete removal of drops of the rinse from the surface before drying, the effectiveness of rather dilute rinses, and the superiority of chromic acid over phosphoric acid as a treating medium by reason of the tendency of the latter to cause spotting. A 0.014–oz/gal (0.11–g/l) hot chromic acid rinse followed by a blow-off or drying without further rinsing can be recommended. If it should be considered necessary to wipe the drops from the surface, a cloth dampened with the chromic acid rinse solution may be used.

The possible effect of different base metals was studied, and no differences in adhesion were detected between steel, brass or zinc under the chromium plate. Parts that had been buffed after plating were investigated with respect to the effect of residues from the buffing compound on adhesion. Apparently the compound could be removed readily without leaving significant residues.

Some time after the presumed completion of the investigation, parts that had been given the recommended treatment were found to be lacking in adhesion of the enamel. They were stripped, re-treated and painted and again failed in the adhesion test. It was noted that such parts exhibited an extreme tendency to show "breaks" in a wet film of alcohol, lacquer thinner, or water. The lack of adhesion was also more marked than usual. A consideration of the "passivity" found in plating operations suggested that our difficulty might be due to a similar cause. It was found that boiling such an item for 15 minutes in either alkali cleaner or plain water eliminated the tendency to water-break, and resulted in good adhesion of the enamel. Samples of this type may be heated in air to eliminate the "break", but this treatment will not improve the adhesion.

Studies made over a period of years have indicated that the passivity effect may be a result of a plating bath condition brought about by irregular additions of chemicals for make-up purposes. It further appears that if these additions are made in extreme amounts, no boiling treatment will suffice to cure the condition. However, inasmuch as possibly 50 per cent of production may not require a chromic acid rinse, and over 45 per cent may be helped by such a rinse, it does not appear practical to boil all work to correct a possible lack of adhesion in less than 5 per cent.

Adhesion is significantly connected with the nature of the paint material. It is commonly accepted that nitrocellulose lacquer will not adhere well to a smooth metal surface, and is not suited to the decoration of chromium plate. However, lacquers may now be formulated to give a degree of adhesion which may be sufficient for decorating parts not directly exposed to the weather. Air-drying enamels are somewhat superior in adhesion to the average lacquer, and a heat-converting baking enamel of the alkyd type may have such excellent adhesion that it is difficult to separate it from the metal with a knife.

In recent years there has been a trend to formulate the synthetic enamels in a manner that sacrifices adhesion to obtain greater lustre and iridescence. This has been carried so far that some enamels do not develop adhesion with four times the usual bake and require 10–14 days of air drying; others never seem to acquire optimum adhesion when either baked or air dried. The use of aluminum powder coated with stearate or similar material as a pigment constituent accentuates any tencency toward poor adhesion, and may be responsible for complete failure. It has always been held unnecessary to use a primer on chromium plate as a base for enamel, but the present trend in the formulation of enamels has made it necessary for some of the manufacturers to add this expensive pro-

(*Continued on page 703*)

TABLE III. EFFECT OF ACID CONCENTRATION AND DRYING TECHNIQUE ON ADHESION AND SPOTTING

Rinse	Concentration oz/gal*	Drying	Ratings	
			Adhesion	Spotting
Chromic acid	0.014	Blow off	Good	None
Chromic acid	0.014	Air dry	Good	None
Chromic acid	0.14	Air dry	Good	Several
Chromic acid	0.14	Oven dry, 100° F	Good	None
Chromic acid	0.14	Wipe off, air dry	Good	None
Chromic acid	0.14	Water rinse, air dry	Fair	None
Chromic acid	0.7	Air dry	Good	Several
Chromic acid	0.7	Oven dry, 180° F	Good	None
Chromic acid	0.7	Water rinse	Fair	None
Phosphoric acid	20%	Air dry	Good	Dark
Phosphoric acid	20%	Blow off	Good	None
Phosphoric acid	0.005%	Blow off	Good	None

*Except as noted.

Colorimetric Determination of Zinc and Cobalt in Gold Alloy Plating Solutions

J. MERMILLOD

DéRobert Frères, Geneva, Switzerland

Introduction

Following the publication of the excellent work by Nell[2] on the determination of gold, copper, nickel and dibasic sodium phosphate, it appeared desirable to add procedures for the determination of zinc and cobalt in gold-alloy solutions. These two metals are not impurities in the solutions but used as alloying constituents in special cases.

Determination of Zinc

The sole reagent used for this determination is diphenylthiocarbazone, $C_6H_5-NH-NH-\underset{\underset{S}{\|}}{C}-N=N-C_6H_5$ (dithizone), which gives a red-colored complex when it reacts with zinc salts.

We have used the "mixed color" method described by Sandell[1].

Many other metals that are present in gold-alloy plating solutions also give colored complexes with dithizone. It is therefore necessary either to eliminate them or to prevent them from reacting by the formation of complex salts. The sodium thiosulfate at a *p*H of 4.5–5 inactivates appreciable amounts of other metals, especially copper. Some modern gold plating baths, however, contain copper in a high concentration, and in that case it must be eliminated; the quantity of sodium thiosulfate necessary for inactivating copper lessens too much the sensitivity of the reaction of zinc with dithizone.

In order to eliminate the excess copper, we have applied a method described by Haim and Tarrant[3] for the colorimetric determination of nickel in nickel silver. This method consists in the precipitation of copper by sodium hypophosphite before the nickel is determined.

The high sensitivity of this colorimetric method forces one to use extremely dilute solutions. The sample which is to be analyzed should be of a size that it contains less than 8–9 micrograms of zinc when 10 ml dithizone solution in carbon tetrachloride containing 10 mg/l dithizone is used in the analysis; at higher zinc contents, Beer's law does not apply.

The dithizone method cannot be used without special precautions:

1. When oxidizing agents are present, the dithizone may be decomposed and give diphenylthiocarbodiazone, $C_6H_5-N=N-\underset{\underset{S}{\|}}{C}-N=N-C_6H_5$, which dissolves in carbon tetrachloride to give a yellow or brown solution. Therefore, even minute traces of oxidizing agents must be removed from the carbon tetrachloride, from the sample to be analyzed, and from the water used for making the solutions.
2. The dithizone must be chemically pure. A dithizone solution may decompose under certain conditions, among them storage at ambient temperature and exposure to light. The standard dithizone solutions must therefore be kept in the dark in a refrigerator.
3. Finally, the intensity of dithizonate coloration requires the use of cells, or cylinders, of small dimensions.

Apparatus required

1. Hellige-Diller Biophotocol photoelectric colorimeter with 5-ml cylinders or equivalent
2. Red filter, 610 millimicrons; green filter, 520 millimicrons
3. 70-ml separatory funnels
5. Volumetric flasks, beakers, filtration funnels, filters, etc.

Reagents required

1. Carbon tetrachloride solution of dithizone—0.001 per cent (10 mg/l)
   The dithizone used was a product of the British Drug Houses, type "B.P.H. Spot Test Reagent". Dissolve 10 mg of dithizone in one liter of pure carbon tetrachloride, purified by the method of P. A. Clifford, cited by Sandell[1]. The solution of dithizone must be kept in a dark, cool place and can be considered good for about one month.
2. Sodium acetate buffer solution of *p*H 4.75
   Dissolve 27.2 g sodium acetate in distilled water, add 12 g acetic acid, and fill to the mark of a

100-ml volumetric flask with distilled water.

3. Sodium thiosulfate solution—25 per cent
   Dissolve 25 g $Na_2S_2O_3 \cdot 5H_2O$ in 100 ml distilled water.
4. Standard zinc solution—1 microgram/ml
   In a 100-ml volumetric flask, dissolve exactly 1 g pure Mossy zinc in about 90 ml 1-*N* hydrochloric acid, and dilute to the mark with distilled water. Pipette 10 ml of this solution into a 1000-ml volumetric flask and dilute to the mark with 0.01-*N* hydrochloric acid.

Solutions 2, 3 and 5 and the distilled water used for making solution 4 must be treated with dithizone. The treatment consists of adding a small quantity of dithizone solution to the solutions and shaking them vigorously. The impurities cause the dithizone to become discolored, and the operation is repeated as many times as is necessary to get a stable green color.

Colorimetric procedure

A. *Preparation of graphs.*—The optical densities of samples containing increasing, known amounts of zinc, from 0 to 10 micrograms, are determined. Meter readings are obtained with both the red and the green filters and two corresponding curves are constructed which give the concentration in ppm that corresponds to the meter reading. The procedure is as follows:

1. Place samples of standard solution containing known amounts of zinc in 70-ml separatory funnels.
2. To each add with a pipette 1 ml sodium acetate buffer solution and 1 ml sodium thiosulfate solution.
3. Dilute with 15–20 ml distilled water.
4. Add exactly 10 ml dithizone solution and shake vigorously for 2 minutes.
5. Let settle and run the carbon tetrachloride into the colorimetric tube.
6. Measure the optical density, first with the red filter and then with the green filter. The reference liquid must be pure carbon tetrachloride.

The colors of the carbon tetrachloride solutions are noted as follows:

½ microgram	green-blue
1 microgram	blue
2 micrograms	purple-violet
3 micrograms	violet
4 micrograms	red-violet
5 or more micrograms	pink-red

B. *Preparation of sample.*—The sample of gold alloy plating bath must be prepared exactly according to the method described by Nell[3*].

C. *Determination of zinc.*—This determination must be made on the solution obtained at step A-10 of Nell's procedure[3*]. Two cases may arise:

(a) When the copper concentration of the bath does not exceed 2–3 times that of zinc, it is possible to inactivate the copper with sodium thiosulfate solution:

Pipette a sample of the solution (for example, 1 ml) and treat it exactly as described in the procedure under A above for preparation of the graphs. The meter readings with the red and green filters are recorded. The corresponding values for the zinc content are read off the two curves and must be the same.

Owing to the extremely high sensitivity of the method, the A-10 solution must always be diluted in order that the sample never contain more than 8–9 micrograms of zinc.

(b) When the copper concentration of the bath solution exceeds 2–3 times that of zinc, copper must be eliminated. The Haim-Tarrant[2] method is used, and as a consequence, gold is also precipitated. This certainly is convenient, gold chloride being an oxidizing agent in the solution. The procedure is as follows:

1. Pipette exactly 5 ml of the solution obtained at step A-10 into a 50-ml beaker.
2. Add a few drops of concentrated hydrochloric acid and 1 ml sodium hypophosphite solution. Heat and boil for a few minutes. Gold and most copper precipitate as a metal powder.
3. Pour the solution into a 1-l volumetric flask and fill to the mark with distilled water. Let the precipitate settle.
4. Pipette a sample of the clear solution (for example 1 ml) and treat it exactly as described in the procedure under A above for the preparation of graphs.

Remarks

1. The zinc content of the unknown may be deter-

(*Continued on page 703*)

*Nell's Method is as follows:

A. Preparation of sample

1. Pipette exactly 10 ml of the plating solution into a clean, dry 250-ml beaker.
2. Under a fume hood (steps 2 to 5) add 10 ml conc'd hydrochloric acid and bring to a boil.
3. Add 2 ml conc'd nitric acid, boil slowly for about 5 minutes without drying.
4. Remove from the heat, add 10 ml 5 per cent sodium hypochlorite solution (prepared by diluting one part of commercial hypochlorite which contains 3.5 per cent available chlorine with two parts of distilled water) and 20 ml distilled water.
5. Simmer the contents on a moderately hot plate (or over a low flame) for ten minutes or more to drive off completely excess chlorine (any traces of free chlorine will interfere with the gold determination). It is advisable to let the solution evaporate slowly, to stop heating just when it starts drying on the beaker, and to leave the beaker on the plate until the contents are completely dry. Fanning the fumes over the beaker with one's hand and taking a cautious sniff will also show when the pungent chlorine odor has disappeared.
6. Add about 50 ml distilled water and swirl the beaker slightly to take up the residue.
7. When fairly cool, transfer all the contents of the beaker into a clean, dry 100-ml volumetric flask by rinsing with a washbottle all residues on the sides and bottom of the beaker carefully into the flask.
8. Fill the flask to the mark with distilled water and mix.
9. Pipette exactly 50 ml into a 250-ml volumetric flask, leaving exactly 50 ml in the 100-ml flask.
10. Fill the 250-ml flask to the mark with distilled water and mix.

PLASTIC DEFORMATION of CHROMIUM PLATED STEEL

CHROMIUM PLATE, because of its hardness and ease of application, is widely used on all types of machine elements to protect softer metals from wear and to salvage worn or undersized parts. However, the advantages of chromium plating are sometimes offset by a reduction in the ability of the basis metal to deform plastically without breaking. To learn more about the effect of chromium plating on the plastic deformation of steels used in aircraft, Hugh L. Logan of the National Bureau of Standards recently made a comprehensive study[1] of the mechanical properties of chromium plated SAE 4130 steel. The results of this investigation, which was sponsored by the Bureau of Aeronautics, Department of the Navy, provides information which is of interest not only to aircraft manufacturers but also to a number of other industries which produce or utilize chromium plated machine parts.

The NBS investigation included tensile, tensile impact, bending, and crushing tests of specimens prepared from rod and tubing of SAE 4130 chromium-molybdenum steel heat-treated to a hardness of about 400 Rockwell scale before the final machining. Some of the specimens were tested as machined, without plating; others were tested after plating to one or more thicknesses; and still others after both plating and subsequent baking at various temperatures up to 440° C (824° F). The effect of baking was of interest because the usual commercial practice is to bake chromium plated steel articles at a temperature of 200° C (392° F) for several hours after plating. Chromium was deposited from a bath containing 250 g/l (33 oz/gal) of CrO_3 and 2.5 g/l of H_2SO_4 (i.e., a CrO_3:SO_4 ratio of about 100) and maintained at 55° C (131° F); a current density of 37.5 amp/dm² (350 asf) was used.

The data obtained (Fig. 1) in all except the tensile impact tests indicate that chromium plating appreciably reduces the plastic deformation that can occur in SAE 4130 steel before fracture. Generally, however, the ability of the plated specimens to undergo plastic deformation was substantially increased by baking at temperatures between 100° and 440° C (212 and 824° F).

Tensile tests were made on specimens plated to nominal thicknesses of 2.5–380μ (0.0001–0.015 inch) as well as on the unplated specimens. Average values for the tensile properties of the unplated steel were as follows: Tensile strength, 13.17 kg/mm² (187,300 psi); yield strength, 12.37 kg/mm² (175,900 psi); elongation in a 2-inch length, 13 per cent; true stress at beginning of fracture, 19.05 kg/mm² (270,900 psi); original area of specimen divided by area at beginning of fracture, 2.088. It was found that the tensile and yield strengths decreased with increasing plate thickness until at a thickness of 380μ (0.15 inch) the values were about 90 per cent of those for the unplated steel. Baking at 200 and 400° C (392 and

752° F) did not produce any appreciable change in these properties. Plating to a thickness of 250μ (0.010 inch) reduced the true stress at beginning of fracture to about 80 per cent and the percentage elongation and true strain at beginning of fracture to less than 60 per cent of that of the unplated steel. However, the baking of plated specimens at 200 or 440° C (392 or 824° F) appreciably increased the values obtained for these properties.

Tensile impact tests were made with the cooperation of the New York Naval Shipyard. These tests were conducted at room temperature; the striking velocity was 8.47 m/sec (27.8 ft/sec). The unplated steel elongated 15.8 per cent, absorbing 64.2 kg-m (464 ft-lb) of energy at failure; reduction in area was 55.2 per cent. The tensile impact properties of plated specimens were 93 per cent or more of those of the unplated steel and were not appreciably changed by baking at temperatures up to 300° C (572° F).

Bend tests were made in a universal testing machine on specimens having a diameter (before plating) of 12.7 mm (0.500 inch) and a length of 254 mm (10 inches). Although unplated specimens could be bent as far as possible in the machine without failure, specimens plated to a thickness of 380μ (0.015 inch) failed after they had been bent through an angle of about 40°. On the other hand, plated specimens baked at temperatures of 200–440° C (392–824° F) could be bent through angles of 70–85° before failure. The moduli of rupture of plated specimens baked at these temperatures were equal to that of the unplated steel.

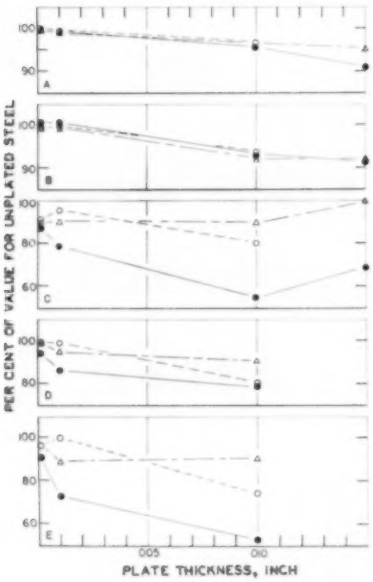


Fig. 1. Mechanical properties of chromium SAE 4130 steel plotted against plate thickness. The ordinate in curve A is tensile strength; in curve B, yield strength; in curve C, per cent elongation; in curve D, true stress at beginning of fracture; in curve E, true strain at beginning of fracture, all in terms of percentage of the corresponding value for the unplated steel. The triangles represent data for specimens baked for 6-8 hours at 200° C after plating; the open circles are for those baked for 1 hour at 440° C after plating; and the closed circles are for those tested without baking

Fig. 2. Cross sections of specimens of SAE 4130 steel tubing after failure in a crushing test. From left to right: unplated specimen; chromium plated specimen tested without subsequent baking; chromium plated specimen tested after baking at 200° C. Note that the unplated tube underwent the most plastic deformation before failure whereas the specimen which had been plated but not baked broke with almost no deformation

In crushing tests (Fig. 2) specimens machined to close tolerances from heavy-walled tubing were tested as machined, after plating on the inside and outside surfaces to a thickness of about 254μ (0.010 inch), and after plating to this thickness and baking at temperatures between 100 and 400° C (212 and 752° F). The specimens were tested to failure by compression between the stationary and movable heads of a universal testing machine in which the load was applied along a diameter of the tube. Plating increased the load necessary to crush the specimen by a factor of about 1.2 and reduced the deformation at failure to approximately 9 per cent of that of the unplated steel. Baking at temperatures of 200–400° C (392–752° F) increased the load necessary to produce failure about 1.4 times and increased the deformation to about 55 per cent of that of the unplated steel.

It is possible that hydrogen deposited with the chromium during plating may be a factor in reducing the amount of plastic deformation that the steel can withstand before fracture. Baking of plated specimens removes hydrogen from the chromium[2] and hence may be expected to increase the ability of the steel to withstand plastic deformation.

REFERENCES CITED

[1]For further technical details, see Hugh L. Logan, "Effect of Chromium Plating on the Plastic Deformation of SAE 4130 Steel", J. Research Nat'l Bur. Standards 46, 472 (1951) RP 2216.

[2]A. Brenner, P. Burkhead, and C. Jennings, "Physical Properties of Electrodeposited Chromium", J. Research Nat'l Bur. Standards 40, 31 (1948) RP 1854.

Colorimetric Determination

(*Continued from page 700*)

mined to within 0.2 micrograms with great precision.

2. This colorimetric method is no more accurate than the gravimetric method, nor is it faster if the zinc content only is to be determined. However, when a complete analysis of the plating solution is desired the colorimetric method for determination of zinc needs only a few more minutes of work after the other elements have been determined.

Determination of Cobalt

Cobalt ions give a stable red coloration with Acid-R (1-nitro-2-naphthol sodium disulfonate) in dilute solution. Neither copper nor gold ions interfere with the reaction.

Reagents required

1. Acid-R solution—1 g/l
2. Standard cobalt solution—1 microgram/ml
   Dissolve 0.404 g cobalt chloride ($CoCl_2.6H_2O$) and 10 ml concentrated hydrochloric acid in a 1000-ml volumetric flask and fill to the mark with distilled water. Pipette 10 ml of this solution into another 1000-ml volumetric flask and dilute to the mark with distilled water.
3. Crystalline sodium acetate, CH_3COONa

Procedure

1. Pipette a measured sample of the plating solution containg less than 20 micrograms of cobalt into a 50-ml Erlenmeyer flask.
2. Add 2 ml of the Acid-R solution and 2 g sodium acetate crystals. The *p*H should now be about 5.5.
3. Heat the solution and keep it boiling for 45 seconds. Add 1.5 ml concentrated hydrochloric acid and boil the solution for another 45 seconds.
4. Cool the solution under the tap, transfer it into a 100-ml volumetric flask, and fill to the mark with distilled water.
5. Measure the transmittancy with a 520-mμ filter, using distilled water as the reference liquid.
6. Read the cobalt content from a calibration curve obtained by the same procedure, except that 5-, 10-, 15- and 20-ml samples of the standard cobalt solutions are pipetted into Erlenmeyer flasks in step 1 instead of the unknown sample.

Acknowledgment

Thanks are due Mr. Victor Sprator and Miss Blanche deQuay of this laboratory, who carried out the experimental work upon which the recommended procedures are based.

References

[1]E. B. Sandell, "Colorimetric Determination of Traces of Metals", Interscience Publishers, Inc., New York, N. Y.
[2]G. Haim and B. Tarrant, Ind. Eng. Chem., Anal. Ed. 18, 51 (1946).
[3]Karl Nell, Plating 35, 346–347 (April, 1948).

How Strong Is That Waste Solution?

Before you dump that spoiled tank of plating solution, consider the contaminating effect on the stream that will receive it—an effect that is measured in parts per million by regulatory agencies.

But platers are accustomed to solution strengths measured in ounces per gallon—not parts per million. What is the relationship?

One ppm of cyanide means one pound of cyanide in 1,000,000 pounds of water. One oz/gal is equivalent to 7,500 ppm.

Here is an example of what this means as suggested by the Metal-Finishing Industry Action Committee of the Ohio River Valley Water Sanitation Commission, an industry group working with the Commission in promoting pollution control:

Supposing a tank with 100 gallons of cyanide solution is to be dumped. Strength of solution is only 5 oz/gal of cyanide—a weak solution in terms of plating. This plating plant is located in a state where the permissible limit of cyanide is 0.10 ppm. One hundred gallons of this solution requires 37,500,000 gallons of water for dilution to reduce it to a concentration of 0.10 ppm. This is enough water to cover a football field to the depth of 105 feet.

Should not every consideration be given to saving that solution by purification?—Ohio River Valley Water Sanitation Commission.

Painting Bright Chromium

(*Continued from page 698*)

cedure to their program. Primers of the type used for dipping sheet-metal parts appear to be well suited to this use. They form a 0.5–0.7 mil (13–18 μ) film in 25 minutes at temperatures between 350 and 400° F (177 and 204° C), and usually have a smooth, glossy surface. It is necessary, of course, to double all handling details when a primer is used. It might be profitable to consider a return to the earlier, less lustrous type of enamel to avoid the necessity of using a primer.

Summary

The following conditions are suggested for satisfactory adhesion of enamel to polished chromium plate:

1. Careful control of the plating bath
2. Adequate cleaning in case parts are buffed
3. A hot chromic acid rinse at 0.014 oz/gal (0.11 g/l) up. Rinse must be kept clean
4. Blow off or dry without further rinse
5. A paint, or enamel, that adheres well to steel
6. An adequate bake to insure adhesion to chromium
7. A paint that suffers no significant loss of adhesion after 2–4 hours immersion at 100° F (38° C) or 16 hours in a humidity chamber with plentiful condensation
8. A primer for those enamels that contain a significant proportion of aluminum flake

Washington Orders

Copies of NPA orders and publications may be obtained from National Production Authority, Washington 25, D. C., or from any of its local offices.

Artificial graphite and carbon electrodes.—With the issuance of Order M-66 on May 31, these items are now subject to allocation and inventory limitations. There are also certain reporting requirements. User of 500 lb per quarter or less needs no allocation; he only has to certify that fact to his supplier. He is also excused from making reports.

Cadmium.—The Cadmium Industry Advisory Committee includes, among others, Messrs. Edwin M. Close, Hanson-Van Winkle-Munning Company; W. W. Harris, Harshaw Chemical Company; William D. Starr, The Lea Manufacturing Company; Harold Leever, MacDermid, Inc.; P. M. Savage, McGean Chemical Company; Clyde H. Reeme, The Udylite Corporation.

At NPA's request at a meeting on May 15, this Committee recommended certain relaxations in Order M-19, among them wider latitude in the plating on cast iron.

Caustic soda and soda ash.—According to an NPA statement at a meeting with alkali and chloride producers, 2½ million tons of caustic soda are now being produced per year, of which 2¼ million tons are consumed yearly. Soda ash capacity is about 4½ million tons per year, ample for current requirements.

Copper.—On May 19 the NPA advised producers of copper and copper-base alloys that it would increase the limits on acceptance of rated orders for shipment in any one month, beginning July 1.

According to a release dated May 15, the brass-mill industry's inventory of melting copper, refinery shapes, brass scrap and zinc was from 37 to 64 per cent lower than on January 1. Total copper imports in 1951 will be less than 500,000 tons, a decrease from last year.

Lead.—Order M-38 was changed in several respects by an amendment dated May 28. "Lead products" now include lead chemicals containing 50 per cent or more by weight (e. g., basic lead carbonate). A dealer must accept rated orders up to 25 per cent of his available lead (formerly 20 per cent). Primary refiners must set aside 5 per cent of production for delivery only upon specific NPA authorization, but any surplus at the end of a month may be disposed of by the producer. Research-laboratory use is exempted from use restrictions. Printers and publishers may recover lead from scrap on toll agreement, and are subject to special inventory rules.

Nickel.—Approximately 20 per cent of the nickel supply was allocated to non-defense use during June, which was about the same amount as in May.

A review of metal-industry committee meetings with the NPA reveals that almost all complain of lack of nickel and that the NPA always replies that the shortage is very critical with no hope of improvement.

Polyethylene.—According to Schedue 5 to M-45, dated May 11, polyethylene is now an Appendix B material. The small-order exemption without use certificate is 500 lb per month.

Sulfur.—This element, used in the production of sulfuric acid, is now controlled, by Order M-69, issued on June 1.

Tin.—An amendment to Ord.r M-25, Cans, makes it permissible to use 0.25 tin plate for small dry-milk containers until July 31, 1951 and provides for some other minor changes.

Trichlorethylene.—The NPA on May 11 recommended that users of trichlorethylene in degreasing operations send samples of used solvent to manufacturers of the solvent who have agreed to reclaim it by distillation if possible.

Zinc.—Order M-9 was amended on May 28 to require that 20 per cent (instead of 10) of anticipated monthly production of special-high-grade slab zinc (99.99 per cent zinc) be set aside for DO-rated orders. For other grades of slab zinc, zinc dust and zinc oxide, the figure remains at 10 per cent. In addition, producers and importers of slab zinc are now required to set aside 5 per cent as a reserve to meet emergency requirements.

Order M-15, according to an amendment issued on May 28, no longer pertains to zinc products but only to zinc (slab and alloy containing more than 50 per cent of zinc). The permitted use during the quarter commencing July 1, 1951 remains at 80 per cent of the average quarterly use during the base period for all zinc except special-high-grade zinc, for which the percentage has been reduced to 70. Maximum monthly use remains at 40 per cent of permitted quarterly use. Exceptions remain unchanged.

A plastic coating shows promise of replacing zinc on conduit tubing, according to a statement made at an NPA meeting with the Electrical Apparatus and Supply Distributors Advisory Committee on May 15.

Metal printing plates.—Order M-65, dated May 31, limits the time that metal printing plates of other than lead, tin and antimony can be held by printing establishments and provides penalties for for noncomp iance.

Pumps, compressors, fans and blowers, motor-generators, electrical control equipment.—According to Order M-61, issued on May 14, manufacturers of these and certain other "machine tools and related items" may use a priority rating DO-75 to obtain needed steel products in an amount varying from 100 to 115 per cent, copper products in an amount varying from 95 to 110 per cent, and aluminum products in an amount varying from 90 to 105 per cent of the amounts used during the base period, i. e., the 3-month period ending March 31, 1951.

Valves and fittings, fractional-horsepower motors.—Manufacturers of these and certain other components, through a new Order M-60, dated May 14, have been given the right to use a DO-70 rating to obtain needed materials. The first 3 months of 1951 is the base period, and 105 per cent of iron and steel products, 100 per cent of copper products and 95 pe· cent of aluminum products may be used.

Controlled materials plan.—CMP Regulations 2 and 4 dealing with inventories and deliveries to distributors, respectively, of controlled materials were issued on May 10.

A Product Assignment Directory, listing some 13,000 items and indicating the NPA industry division handling each item was issued on May 7. A reprint of the Official CMP Class B Products List is attached. The "B" products are also included in the directory.

A Requirements Committee, including representatives of claimant agencies, responsible for reviewing over-all demands for steel, copper, aluminum and other critical materials and for recommending policies and programs for balancing supply and demand, was formally established on May 14. It will be assisted by a Program Adjustment Committee. The claimants, according to DPA Order 1 of May 24, are The Secretaries of Defense, the Army, Agriculture, the Interior, and Commerce; the Atomic Energy Commission; the Administrators of the Federal Civil Defense Administration, the Federal Security Agency, the General Services Administration, Veterans Affairs, the Housing and Home Finance Agency, the Defense Transport Administration, the NPA and the EPA, and the Petroleum Administrator for Defense; The Office of Civilian Requirements, The Facilities Bureau and the Canadian Division of the NPA; and the Director of the Office of International Trade of the Department of Commerce. The field of jurisdiction of each is set forth in the order.

(Continued on page 765)

CODMAN

Increase Production and Lower Costs with

* MADE UNDER PATENTS NUMBERS 2,027,863; 2,094,650; 1,573,961; RE 19,894; 2,140,258. OTHER PATENTS PENDING.

CODMAN * *Ventilated* Non-Fray BUFFS

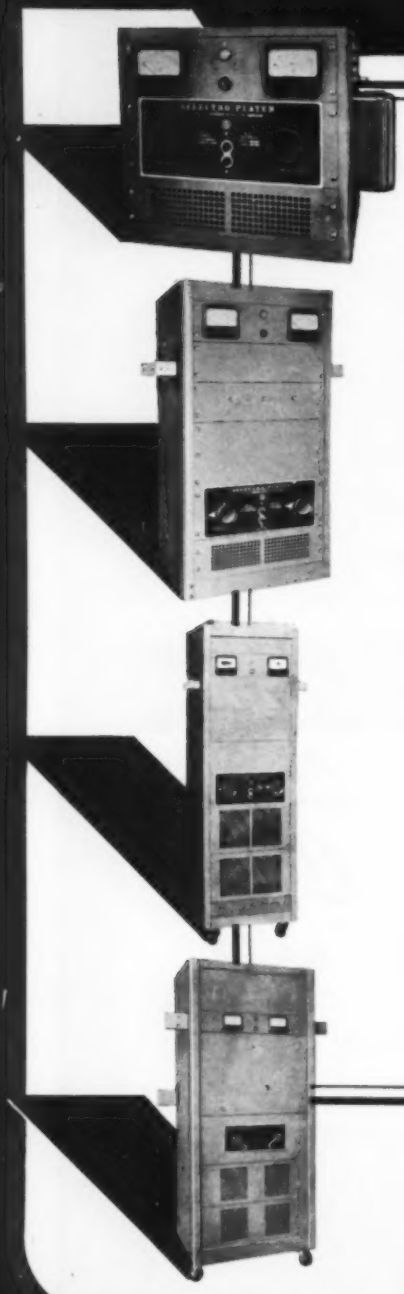
For Over 55 Years the Greatest Name in Buffs

F.L.&J.C. CODMAN COMPANY

ROCKLAND · MASSACHUSETTS

BRANCH OFFICES: PHILADELPHIA DETROIT LOS ANGELES INDIANAPOLIS GRAND RAPIDS

The Most Complete Line of



SELECTRO-PLATERS

The Selectro-Plater line (the original selenium rectifier for electroplating) includes over two hundred standard types ranging in capacity from 50 amperes to 5,000 amperes and in maximum voltage ratings from 6 volts to 60 volts. These units are available in three forms—basic, standard and remote control, and are used to supply D.C. power for full scale production, electroplating, anodizing, etc.

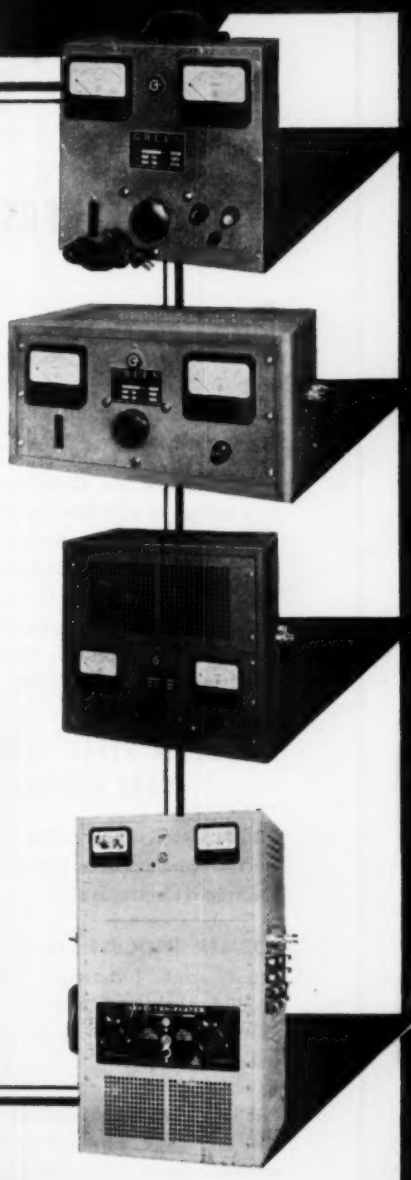
Only a few units are shown on this page. The complete line of standard units and the exclusive Green features are described in the twelve page Selectro-Plater Book—Fourth Edition—available on request from Green Electric or its representatives.

Custom-Building

Green Electric specialize in custom-building units to meet unusual requirements of layout or control, and have already engineered several thousand special jobs. A.V.S. (Automatic Voltage Stabilization) and A.C.S. (Automatic Current Stabilization) are two typical advanced developments originated by Green engineers.

INDICATE A 617.

Rectifiers in the World ...



BENCH RECTIFIERS

The Bench Rectifier line offers a choice of thirty units of the portable or semi-portable type designed primarily for laboratory or small scale production work. They range in current capacity from 25 to 150 amperes and in maximum voltage ratings of from 6 to 16 volts. Special units can be had to provide higher voltages.

Standard units are equipped with cord and plug for connection to 115 volt A.C. outlet. Features include noiseless operation, natural-cooled selenium rectifier, circuit breaker switch, continuously variable voltage control, and many others. Full details are given in the Bench Rectifier booklet—Third Edition, available on request from Green Electric or its representatives.

MULTI-RECTIFIERS

The Multi-Rectifier is the de luxe laboratory power supply unit. It is three-phase operated and permits exact duplication, on a smaller scale, of the results to be expected in the plant from larger Selectro-Platers.

Four different voltage ranges are available at will from the Multi-Rectifier: 0-8, 0-16, 0-24 and 0-48 volts, thus permitting control tests or research on processes ranging from silver plating to chromic acid anodizing. Described in Third Edition, Bench Rectifier booklet. Available on request from Green Electric or its representatives.

W. GREEN ELECTRIC COMPANY, INC.

SELECTRO-PLATERS AND ALL TYPES OF RECTIFIER EQUIPMENT

GREEN EXCHANGE BUILDING, 130 CEDAR STREET, NEW YORK 6, N. Y.

FOR PLATING STEEL

UNIQUE CLEANERS IMPROVE RESULTS—SAVE MONEY

Diversey No. 909 and No. 12 are two outstanding cleaners specially developed to provide superior finishes on steel surfaces through better, more thorough cleaning performance.

No. 909 and No. 12 are easily applied to a variety of different cleaning routines. No. 909 is a unique heavy duty soak tank cleaner. No. 12 is an electrocleaner for both direct and reverse current. The following case history is typical of the results you can expect through the application of Diversey No. 909 and No. 12.

TUBULAR STEEL FURNITURE CASE HISTORY

PROBLEM: To clean polished steel tubular furniture prior to bright nickel and chromium electroplating.

FORMER PROCESS: Included mineral spirits soak, handwipe, spray wash, alkaline soak and two electrocleaning operations. Six men, working steadily, were required.

PRESENT PROCESS: Includes Diversey No. 909 soak, and Diversey No. 12 reverse current electroclean.

RESULTS: The Diversey Process completely removes oil and grease from the inside of the tubes, avoiding contamination of pickle and nickel tanks as characterized the previous process. The cleaner tanks now are dumped every two weeks rather than every week as was formerly necessary. The No. 909 and No. 12 are the only materials this leading finishing plant has found that would eliminate the solvent and handwipe operations. The elimination of handwiping labor costs results in an estimated savings of $15,000.00 per year. A definite improvement in smoothness and luster of the electrodeposit resulted with Diversey No. 909.

COMPLETE INFORMATION AVAILABLE

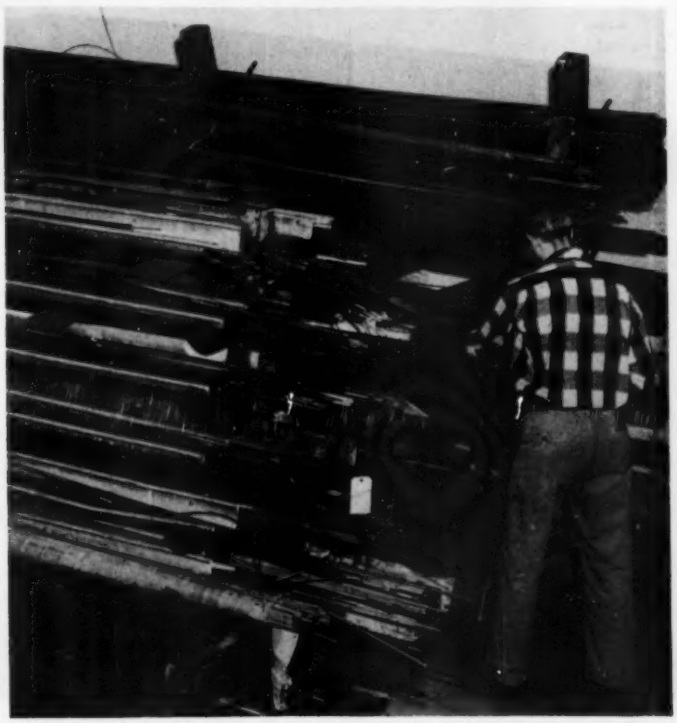
For additional information, including technical bulletins, write or call your Diversey D-Man. He will be pleased to work with you. Write or call today. *The Diversey Corporation, Metal Industries Department, 1820 Roscoe Street, Chicago 13, Illinois. In Canada: The Diversey Corporation (Canada) Ltd., Lakeshore Road, Port Credit, Ontario.*

Diversey

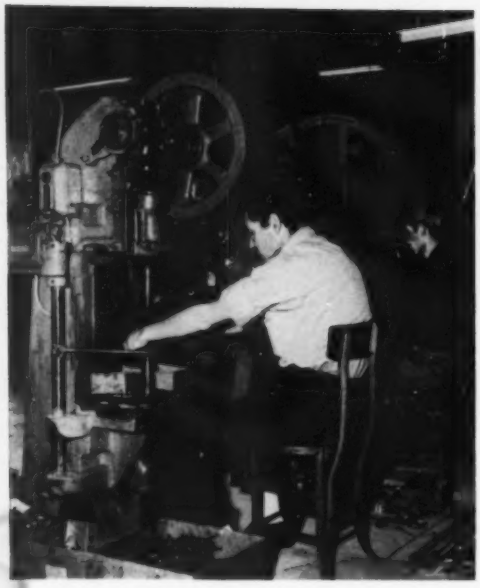
RACK MAKING

The necessity for properly designed racks for plating, anodizing, etc., has become recognized more and more during the last several years. Not only must the rack withstand the mechanical abuse in the shop, but above all it must conduct the needed current to each part and hold the parts securely in the most advantageous position for even current and plate distribution. Building racks has therefore become a science and a highly developed art, and several companies have specialized in it.

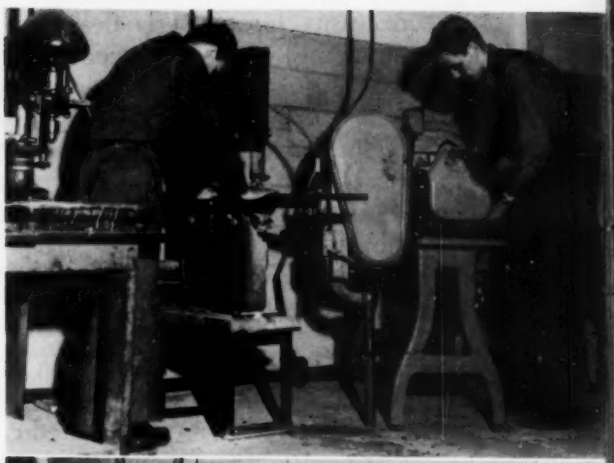
The pictures shown here have been supplied by Mr. Edsel L. Faulman, president of National Rack Company, Paterson, N.J., and associated companies, Imperial Plating Rack Company, Flint, Mich., and the newly organized The American Rack Company, Chicago, Ill., which manufacture the Na-Ra-Co racks. They show something of the know-how and care that goes into the building of modern plating racks.

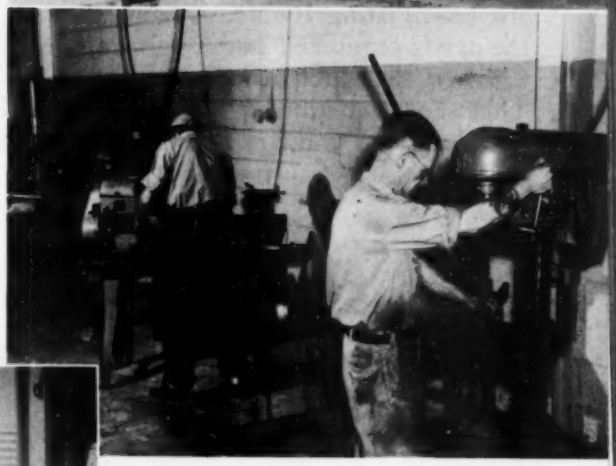


Rod and wire of almost every size are used in the manufacture of racks.

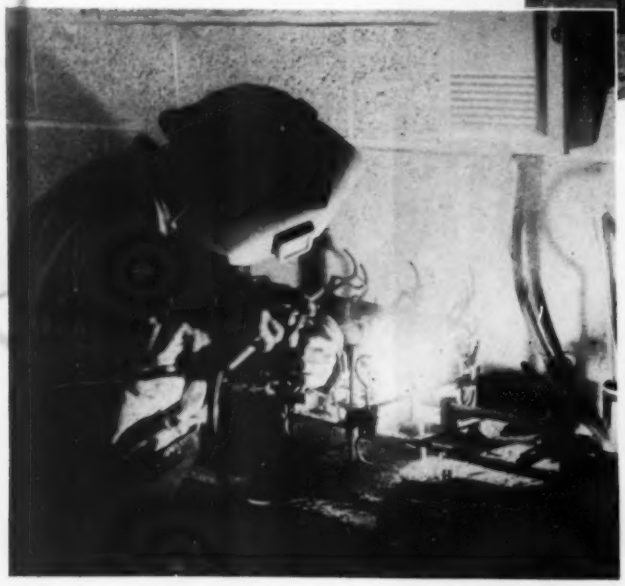


Rack fabrication begins with cutting and forming the material by means of precision punch-press dies.



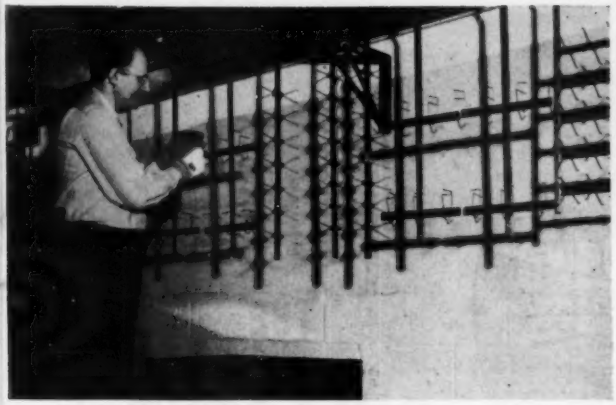


Many exacting machine operations are required.



Welded construction is employed on many racks to assure rigidity.

Replaceable tips are made by a series

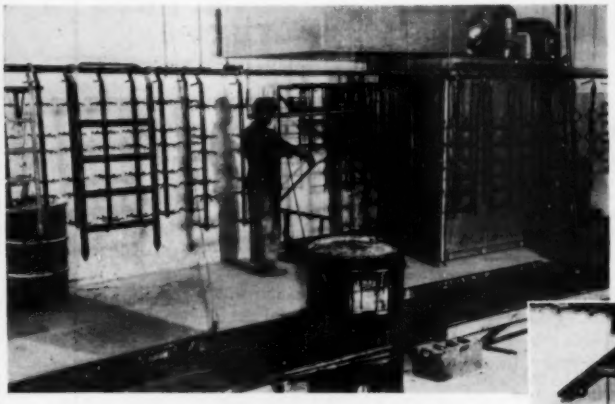


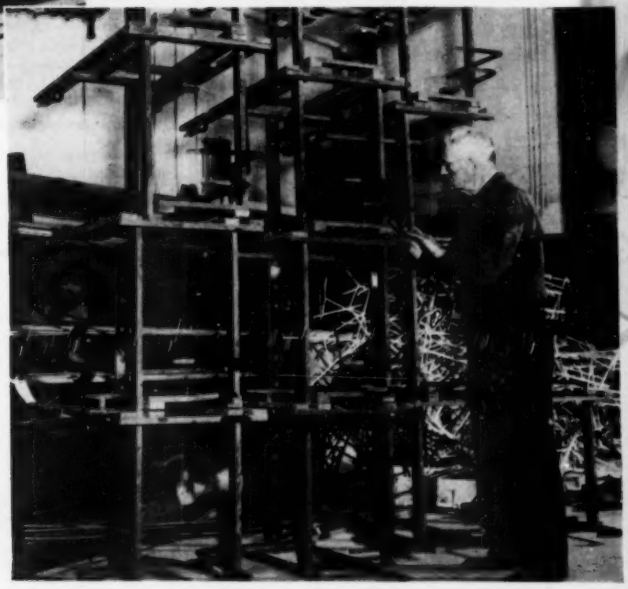
Inspection prior to coating insures the quality of the rack.

Rack coating is removed from tips

←

The all-important rack coating is applied by dipping and is cured in ovens specially designed for proper diffusion of heat.





of precision bending operations.

A lot of racks is ready for shipment.

BUFFALO

THE

BULLSEYE

OF THE

METAL FINISHING INDUSTRY

Thirty-four of the forty-four branches of the AMERICAN ELECTROPLATERS' SOCIETY are located within a radius of 460 miles of BUFFALO. Milwaukee the most western point in the circle 460 miles—Boston the most eastern 440 miles.

BUFFALO the perfect vacation spot and the only Convention City in the nation with a World Wonder attraction—NIAGARA FALLS—HIGH AND MIGHTY IN ALL HER GLORY.

The papers to be presented at the BUFFALO A. E. S. CONVENTION will be most timely and particularly pertinent to the present problems in the METAL FINISHING FIELD.

While the men are busy at the Technical side of the convention, an excellent social program has been planned for the ladies and of course they will join in the social activities planned for the men.

Buffalo beckons with program to please
All in the coolness of Lake Erie breeze.
Knowledge is gained, and you have your fun
At Platers' Convention in fifty-one.

CONVENTION HEADQUARTERS

Thirty-Eighth National A. E. S. Convention
Buffalo, New York · July 30-31, August 1-2, 1951

project no. 12

project director:

HENRY B. LINFORD*

associate:

EDW. B. SAUBESTRE*

location:

COLUMBIA
UNIVERSITY,
NEW YORK CITY

Acknowledgment is due the Research Committee, Dr. W. A. Wesley, The International Nickel Company, Chairman; the Research Directing Committee, Mr. G. M. Cole, Ternstedt Division, General Motors Corporation, and Dr. Donald Price, Oakite Products, Inc., Chairman and Vice-Chairman, respectively; and the Project Committee, Mr. E. T. Candee, Lea Manufacturing Company, Chairman; Dr. W. A. LaLande, Jr., Pennsylvania Salt Manufacturing Company, and Dr. Edward Parker, Technic, Inc., for their contributions to this project.

Cleaning and Preparation of Metals for Electroplating

III. DEGREASING EVALUATION TESTS: THE ATOMIZER TEST*

SUMMARY

The "*atomizer test*" is introduced; this is a new method for determining the presence of greasy materials on a metal surface. The test involves the following steps:

1. Evaporation of all surface moisture
2. Spraying of water against panel using an atomizer
3. Measuring of areas covered by thin, uniform film of water

Details of the equipment and procedure are given. Results obtained with oiled panels which were cleaned to various degrees in alkaline solutions are presented. The theory underlying all wettability tests and differences between the atomizer test and other wettability tests are discussed.

TABLE OF CONTENTS

1. Introduction: A New Degreasing Evaluation Test 713
2. Experimental
   (a) Equipment 714
   (b) Procedure 714
   (c) Recording of Results 714
3. Results
   (a) Cleaning Conditions 715
   (b) Tabulated Results and Correlations 716
   (c) Discussion 716

OBJECT

The object of this phase of the project was to develop a new degreasing-evaluation test which would be sensitive, reproducible, inexpensive, and easy to apply.

1. INTRODUCTION: A NEW DEGREASING EVALUATION TEST

It was pointed out in the "Critical Survey of the Literature"[103a] that failure of plating may arise from a large number of causes. The sources of such failure were divided into a number of classifications. It was indicated in the next paper in this series[103d] that this project would begin by studying the effect of oil residues on plating. Later, other sources of plating failure, such as oxide, smut, crystallographic imperfections, etc., will be investigated, with the ultimate goal of developing tests which will indicate definitely the quality of deposit which may be expected from a given sample. At the present, therefore, tests which will indicate the presence of oil only are under consideration.

In developing a new degreasing-evaluation test, the main criteria considered were sensitivity, reproducibility, cost, and ease of application. It was felt that such a test, if at all possible, should be based upon some form of wettability test (such as the water-break and spray-pattern tests) because such tests are simple, inexpensive, and sensitive[103c].

The new test which has been developed has been termed the "*atomizer test*". It is related to the water-break and spray-pattern tests. These two latter tests were discussed previously[103c]. The spray-pattern test renders the water-break test capable of quantitative interpretation; in this test, the panel undergoing the water-break test is subjected to a fine spray of water from an atomizer nozzle after ½–1 minute has elapsed following removal of the panel from the rinsing bath. Areas wetted at the commencement of spraying remain wetted. Areas dry at the com-

*AUTHORS

*This paper is based on laboratory work done between May, 1950 and August, 1950.

mencement of spraying become covered with small water globules. Thus, the soiled areas may be accurately measured. The atomizer test differs from this spray-pattern test, developed by Spring[108], in that the panels are dried completely before spraying. It will be shown later that this difference is a most important one; but first, some experimental details will be given.

2. Experimental

(a) *Equipment*

The equipment used in the atomizer test corresponds to that used in the spray-pattern test. All that is required is a supply of clean compressed air and an atomizer. The air pressure found most suitable is 18±3 inches of mercury (9 ± 1.5 psi). The exact pressure used is not critical. The air should be filtered to remove any oils or dirt present initially. The atomizer used in this project is a de Vilbiss No. 251 bulb atomizer, of 15-ml capacity. For details on the spraying characteristics of this instrument, see Appendix (d). The bulb is removed and the atomizer is connected to the compressed air line. The air enters a 5-gal (19-l) carboy half filled with distilled water, and goes thence to a tube filled with glass wool and to an empty 2/3-gal (2½-l) bottle which acts as a surge vessel. Thence it goes to a glass tee, which leads to the manometer and to the atomizer.

The solution used in the atomizer is a 0.1 per cent (by wt) solution of Niagara Sky Blue 6B Conc. Dye (National Aniline & Dye) in distilled water. Section 2 (c) below (Recording of Results) will indicate the purpose of adding the dye.

(b) *Procedure*

After the panels have been cleaned, and are ready for testing (see Linford-Saubestre[103d], Table I), they are hung in a vertical position in air at room temperature (26–29° C; 79–84° F) and are allowed to dry completely in the central 2 x 3-inch (50 x 75-mm) portion of the panel. This process can be hastened by removing the drop which collects at the bottom by touching with a glass rod. In general, about 3–5 minutes are required for this to occur. While still water-wetted, the oils do not spread. On exposure to air, some spreading begins to take place, particularly of mineral oil. Since the time period involved is quite short, however, spreading is quite minor in importance. When the rectangular central portion of the panel is ready for testing, the sprayer is placed at a distance of 2 feet (0.61 m) from the panels (three panels are tested simultaneously), and spraying is begun. It is continued until the pattern has developed, which takes about 30–45 seconds (about 10 ml of solution are used). It is not easy to give exact directions for spraying the panels, as a little experience is required to determine exactly when the pattern has developed. However, a general guide can be given.

Time.—If the time of spraying is too short, the pattern does not receive the opportunity to develop sufficiently, and the contrast between "clean" and "dirty" areas is vague. If the time of spraying is excessive, water droplets will build up and flow down the panel surface, and "dammed-up" water films will spill over and obscure the pattern. If spraying is continued long enough, a point will eventually be reached at which the pattern will essentially approach that of the spray-pattern test. As was stated above, experience will soon indicate when the pattern has developed, although at the start, a period of 30–45 seconds may be taken as a guide.

Distance.—If the distance between the panel and the atomizer is too short, the randomness of the droplet distribution is reduced, the pattern may be obscured by too rapid development, and the possibility of mechanical action of the spray in causing oil spreading is increased. If the distance is too long, minor air currents in the room will affect the rapidity with which the patterns develop in the three panels under test. Furthermore, unless the atomizer has an ample capacity, there is the danger of running out of solution before the pattern has developed adequately. Although a distance of 2 feet (0.61 m) was used, a rather wide tolerance of ±0.5 feet (0.15 m) is permissible in conducting the test.

Pressure.—If the pressure is too low, the droplets are not evenly distributed as to size, resulting in the formation of a rather coarse pattern, which may not lead to very accurate results. If the pressure is too high, the pattern may develop so rapidly that run-off of droplets and of "dammed-up" films may occur rather rapidly, and it may not be possible to get all three panels to develop patterns in the same period of time. In the laboratory, a pressure of 18 ± 3-inch mercury (9 ± 1.5 psi) was used. However, the pressure could vary beyond these limits fairly extensively before changes in cleaning-index values would be noted.

Temperature.—The panels should be dried at room temperature. If the temperature is raised in order to dry the panels more rapidly, the oil present will spread, thereby changing the cleaning-index values. In addition, if the panel is hot during spraying, the tiny droplets will tend to evaporate on contact, thereby obscuring the pattern completely.

Drying.—If there is water still present on the panel when spraying is begun, the results will be invalid, as a situation similar to the spray-pattern test will obtain. Conversely, spraying should be started as soon as the central 2x3-inch (50x75-mm) central portion of the panel is dry, even though the triangular bottom part of the panel be still wet. The bottom part of the panel is not being evaluated, and the longer the period of time elapsing during drying, the greater is the danger of changing results owing to spreading of oil. A slight amount of corrosion may occur on clean areas. This is not objectionable, as the oxide does not cause water-break, as mentioned previously[103b].

(c) *Recording of Results*

Drying.—As soon as the spraying of the panel has been completed, the panels are dried by heat from a No. 2 Photoflood lamp placed about 1 foot (0.3 m) away from the panels. This freezes the pattern for permanent recording, staining the panel with the blue dye wherever water globules were present. Where uniform water films were present, the dye is too diluted to leave much stain upon drying. The oil spreads during this operation as soon as the water globules have been evaporated, but this in no way affects the dye pattern, which has been established previously. As a matter of fact, after drying, the oil may be removed by ether extraction if desired. A slight amount of corrosion will occur where the panels were "clean", i. e., where uniform films of water were present. In addition, where agglomerated water droplets were present, the part of the panel near the center of the agglomerated droplet may have been clean originally, and because of that and the fact that a relatively thick water layer was present prior to drying relatively heavier corrosion may occur at such points on the panel.

It should be remembered that the agglomerated water droplets or "dammed-up" water films may be rather delicately poised on the panel surface. Any movement of the panel may cause run-off, with consequent destruction of the pattern. Hence, the recording method should not involve handling of the panel if at all possible. This is another advantage of heating the panels to dryness immediately upon conclusion of spraying in order to freeze the pattern.

Pantograph.—Owing to corrosion, and the light sensitivity of the dye used, the patterns obtained are obscured in time, and after a day or two may be quite difficult to detect. Therefore, it is advantageous to make a more permanent record of the results. A pantograph was used to magnify the patterns (2X) and record them on paper. Areas which had evidence of water globules were recorded as "dirty" and those which had no dye specks were recorded as "clean". Only the central 2x3-inch (50x75-mm) portion of the panel was considered. Comparison of results obtained by measuring soiled areas from the panels directly with those obtained by measuring those areas on patterns reproduced with the pantograph showed no inaccuracies arising from the use of the pantograph. The use of a pantograph to record results has two primary advan-

tages: (a) a permanent record of results is made, and (b) planimeter measurements of areas need not be made at the moment of testing, but may be deferred to periodic intervals when large numbers of samples may be analyzed at one time.

It was found advantageous first to delineate the boundaries of the clean areas on the panel with a pencil and then to run the indicator of the pantograph along the pencil lines, but this particular feature is not absolutely necessary.

Planimeter.—The pattern areas are measured with a K & E polar planimeter. Areas from 0.001 sq in (2/3 mm²) and up may be accurately measured. Different techniques were utilized in using the planimeter depending upon the magnitude of the area being measured. Duplicate readings differed by 1 per cent or less.

Alternate methods for recording results.—When Spring developed the spray-pattern test[10b], the method used to record the results was simply to sketch the patterns on cross-section paper. A comparison of sketches made by various observers showed that subjective errors were not too important. In a paper presented recently (unpublished), he presented a refinement of this method. The panel is placed in a groove inside a lucite holder, and the observer sketches the pattern in wax on the lucite cover. These may be considered alternate ways of recording patterns. However, if the panels are not to be re-used, the method we have presented here would seem capable of greater accuracy; if the panels are to be re-used, it may be considered too destructive to be useful. If a dye is added to the water, as is the case here, still another method of recording the patterns may be utilized, namely, photographing of the samples. Such photographs, however, do not generally permit of highly accurate calculations. More will be said about these alternate ways of recording atomizer-test results in the next paper.

TABLE I. CLEANING CONDITIONS

Conditions used indicated by crosses

Cleaning Conditions		Oil	
Temp °C	Time min	Mineral	Lard
100	3	X	X
	10		X
70	3	X	X
	10	X	X
	20	X	X
40	3	X	
	10	X	
	20	X	X

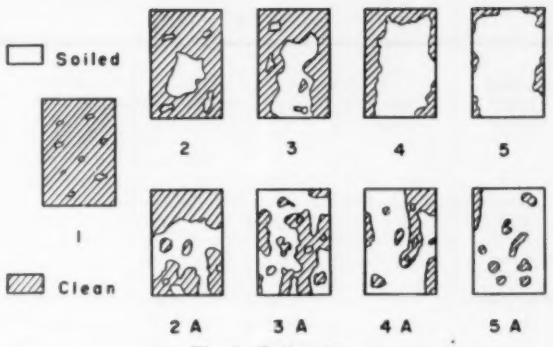


Fig. 1. Pattern types

3. Results

The nature of the atomizer test has been presented, and some results obtained with this test will now be considered.

(a) *Cleaning Conditions*

It was indicated in the paper on soiling and cleaning procedures[10d] that the time and temperature of alkaline cleaning would be the variable used to obtain a wide range of cleaning conditions.

Range.—The cleaning conditions listed in Table I permitted a study of panels cleaned over a range of cleaning indices from 0 to 100. Details of the soiling and cleaning procedures used were given in a previous paper[10d] and will not be repeated here.

Blank runs.—Before the atomizer test was run on panels cleaned in the manner indicated above, it was necessary to establish that the cleaning index would really be 100 in the absence of residual oil. In order to do this, three blank runs were made at a cleaning condition of 100° C (212° F) and 20 minutes (maximum cleaning condition investigated). One sample was not soiled, a second was soiled in mineral oil, and a third in lard oil. A fourth sample, unsoiled, was tested after cleaning at 40° C (104° F) for 3 minutes (minimum cleaning condition investigated). All four panels gave cleaning indices of 99.5–100.0. When such panels were allowed to remain exposed to the laboratory atmosphere for over one hour, water-droplet formation, due to contamination from the air, was noted on testing. On the other hand, if the panels were placed in a desiccator for a period of 24 hours and then tested again, the cleaning-index value showed no significant change.

When the panels had dried, and were ready for testing, there was little visible evidence of corrosion. After testing and drying, noticeable amounts of corrosion products appeared on the panels. After a second testing and drying, corrosion of the panels began to be fairly extensive.

The surfaces used in these studies are matte, as indicated previously[10d]. Furthermore, as just mentioned, the "clean" low-carbon steel surfaces tend to rust. Both rust and surface roughness tend to make surfaces more hydrophilic (easier to wet), i. e., to lower the contact angle for water. This would tend to convert water droplets to films on heavily rusted, scaled, or deeply roughened surfaces.

In order to determine the range of usefulness of the atomizer test, the following surfaces were cleaned and then tested:

Stainless steel	polished
Chromium-plated steel	mirror-bright
Copper	matte
Aluminum	polished

In all cases when the panels were cleaned sufficiently, the atomizer tests gave a cleaning index of 100, i. e., the water spread on the panel as a thin film, without evidence of droplet formation. It appears fairly safe to say, therefore, that "clean" surfaces will give a cleaning index of 100 in the atomizer test, whether smooth or rough, and whether rusted or not.

Pattern Types.—During the oil-drainage period, there is a concentration of oil at the triangular bottom part of the panel. However, testing is done only on the central portion of the panel, so that the distribution of oil is somewhat uniform over the part of the panel being tested. As a result of this somewhat uniform oil distribution, the atomizer-test patterns obtained tend to be random. Thus, it has not been possible to ascribe any representative pattern to panels cleaned at any given cleaning condition. However, eleven general classifications of patterns have been made, based upon cleaning-index range, and Table II presents an approximate correlation of pattern types *vs* cleaning conditions. In Fig. 1, some typical patterns obtained on individual panels are shown. Again, it should be emphasized that these patterns are only intended to show some typical results, and that no characteristic pattern

TABLE II. PATTERN TYPES

Cleaning Index Range	Pattern Type	Test Conditions		
		Oil	Temp °C	Time min
100	0	Mineral	100	3
		Mineral	70	3, 10, 20
		Lard	100	10
85–100	1	Mineral	100	3
		Mineral	70	3, 10, 20
		Lard	100	10
50–85	2	...	...	...
	2A	Lard	70	20
35–50	3	Mineral	40	3, 10, 20
	3A	Lard	70	20
15–35	4	Mineral	40	3, 10, 20
	4A	Lard	100	3
		Lard	70	10
0–15	5, 5A	Lard	70	3
0	6	Lard	40	20

for any given cleaning conditions could be developed.

(b) *Tabulated Results and Correlations*

Table III presents some of the salient results obtained with the atomizer test. Table IV correlates atomizer test results on individual panels with water-break and oil coverage.

Water-break is measured by removing samples vertically from the final water-rinse bath and observing the length of time required for water-break to occur. If no water-break has occurred in one minute, the time for water-break to occur is considered as infinity, because after about one minute evaporation to dryness begins. The figures given in the table for water-break are in seconds. A number, followed by infinity, indicates the number of seconds required for water-break to occur at very small points on the surface corresponding to tiny residual oil globules, with the balance of the surface showing no water-break. "Trace" indicates that there is no water-break, but that as the water drains tiny specks of break appear which immediately fill in again with a uniform film of water.

Oil coverage indicates the percentage of the panel area which contains evidence of residual oil. For example, an oil coverage of 50 would mean that 50 per cent of the panel would contain no evidence of residual oil, while the remaining 50 per cent would contain evidence of oil globules scattered about this part of the surface. The qualitative estimation of coverage is made by merely examining the panel visually as it leaves the final pre-testing bath.

Appendix (e) tabulates the results obtained on individual panels.

TABLE III. ATOMIZER TEST RESULTS

Cleaning Condition		Mineral Oil					Lard Oil				
Temp °C	Time min	C.I.	σ	n	O.C.	W.B.	C.I.	σ	n	O.C.	W.B.
100	3	96 8	3 9	12	0	Inf.	21 8	9.4	12	0–25	3
	10	...	...	...	...	...	96 0	4 5	15	0	Inf.
70	3	98 7	2 1	9	0	Inf.	9 0	8 0	12	75–100	0
	10	91 8	12 2	9	0	Inf.	17 7	6 0	12	50–75	1
	20	99 0	1 8	12	0	Inf.	33 2	11 7	9	25–50	2
40	3	37 2	14 0	12	0–25	0 + Inf.	...	...	...	...	...
	10	40 9	13 9	6	0–25	Trace	...	...	...	...	...
	20	37 9	12 2	9	0–25	Trace	0 0	0 0	3	100	0

C.I. = Cleaning Index
O.C. = Oil Coverage
W.B. = Water-break

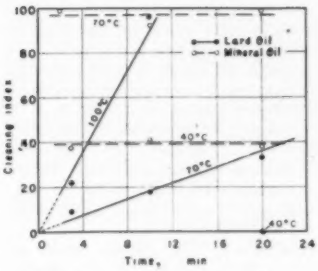


Fig. 2. Atomizer test results

(c) *Discussion*

The mineral oil was removed more readily than the lard oil, as can be seen in Table III and Fig. 2. In the case of lard oil, the atomizer test was able to distinguish clearly between various degrees of cleaning, as shown by the effect of temperature and time on the cleaning index. It is seen on the graph that the cleaning index for lard oil increases approximately linearly with time. The higher the temperature, the steeper the slope of the curve. Thus, at 100° C (212° F), the cleaning is nearly perfect after 10 minutes, whereas at 70° C (158° F) only about 1/6 of the panel is free from water droplets after 10 minutes. At 40° C (104° F), the panel is still completely oil covered after 20 minutes.

The case of mineral oil appears startling at first glance. The effect of temperature is as would be expected, with nearly perfect cleaning at 70° C (158° F) and 100° C (212° F), and poorer results at 40° C (104° F). However, at 40° C (104° F), time seems to have no effect on

the cleaning-index value. To explain this, we must go back to the cleaning procedure. After alkaline cleaning, the panels are rinsed in water for 5 minutes, dipped in 1 per cent HCl for 1 minute, and rinsed again for 2 minutes. This post-cleaning treatment has little effect on lard oil, and there is little difference between the appearance of the sample when it leaves the alkaline cleaner and when it is tested about 15 minutes later. Pure mineral oil, such as that used here, on the other hand, can be removed fairly well in due course of time simply by immersion in water. As a result, a substantial part of the cleaning may take place when the panels enter and leave the solution interfaces as they go from the cleaning bath to the rinsing bath, to the acid bath, and finally, back to the rinsing bath again. Thus at 40° C (104° F), the alkaline cleaner, in the time range investigated, does not seem to play as big a role as the post-cleaning operations. If the panel were left in the alkaline cleaner sufficiently long the index value would, of course, eventually climb to 100.

Appendix (a) discusses in terms of statistical criteria the quantitative relationships of time and temperature with cleaning index, which have here been discussed qualitatively.

Examination of the atomizer-test results has shown that this test can distinguish between various degrees of cleaning. It remains to be shown whether the test is sensitive, and whether the results obtained with it are reproducible.

TABLE IV. ATOMIZER TEST CORRELATIONS ON INDIVIDUAL PANELS

Cleaning Index Range	Oil Coverage %	Cleaning Index Range	Water-Break sec
70–100	0	0–25	0
16–64	0–25	9–34	1
9–58	25–50	9–58	2–4
10–34	50–75	16–60	0–2 + Inf.
0–6	75–100	25–64	Trace
0	100	70–100	Inf.

An examination of Table IV will show that the atomizer test provides greater sensitivity than a visual inspection, and evidences the existence of oil residues far more strikingly than the water-break test. Selecting one range at random, one will observe that for an oil coverage of 25–50 per cent (i. e., a cleaning-index value of 50–75), the atomizer-test results are in the range of 9–58. In the case of water-break, the last three categories in the table, 0–2 + Inf., trace, and Inf. should be considered. In all of these cases, water-break either does not exist or is difficult to detect. Yet, in this same range, the atomizer test gave index values as low as 16, and index values as low as 70 where absolutely no water-break occurred. In the next paper, comparisons will be made between the atomizer test and other degreasing-evaluation tests wherein the greater sensitivity of the atomizer test will again be strikingly shown.

With regard to reproducibility, values of σ are given in Table III. As the values of σ are quite high, it indicates that the results of this test are not very reproducible, especially where the value of C.I. approaches 50. This fairly poor reproducibility appears to be associated with the high sensitivity of this test. Further details will be found in Appendix (b).

Irregularities in procedure will often markedly affect the results obtained. In particular, the age of the solvents and the nature of the acid dip after alkaline cleaning affect the C.I. results. For further details, see Appendix (c).

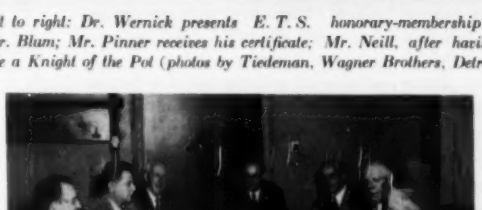
Dr. Blum Honored

The Detroit Branch of the American Electroplaters' Society had the honor of serving as host to Dr. William Blum, of The National Bureau of Standards, at a special meeting on May 18, when he was personally presented with an honorary membership in the British Electrodepositors' Technical Society by its executive secretary, Dr. S. Wernick. The meeting was in the Hotel Statler, and saw present upward of 250 members of the Branch and a number of guests from other Michigan Branches.

Walter Pinner introduced the guests and was also presented by Dr. Wernick with honorary membership of the E. T. S. Pinner, in his turn, presented A. E. S. President William J. Neill with membership in the famous "Knights of the Pot" organization of A. E. S. Past Presidents.

After a short speech of acceptance of his E. T. S. honorary membership by Dr. Blum, Dr. Wernick presented a paper on "British Electroplating Practice", and showed a movie entitled "Roto Dipping Car Bodies". W. M. Phillips, Head of General Motors electroplating research and an elder statesman of the A. E. S., followed with a talk on "Current U. S. Plating Practice".

From left to right: Dr. Wernick presents E. T. S. honorary-membership certificate to Dr. Blum; Mr. Pinner receives his certificate; Mr. Neill, after having been made a Knight of the Pot (photos by Tiedeman, Wagner Brothers, Detroit)



A. E. S. First Vice-President C. F. Nixon, A. E. S. President W. Neill, Dr. Blum, Dr. Wernick, A. E. S. Past Presidents W. Pinner and W. M. Phillips, and Detroit Branch President F. L. Clifton in a friendly chat (photo by Tiedeman, Wagner Brothers, Detroit)

Book Review

DR. HAROLD J. READ

Associate Professor of Metallurgy, Pennsylvania State College

METALLIC AND NON-METALLIC COATINGS FOR GRAY IRON by C. C. Burgess, 66 + viii pages, 1950. Gray Iron Founders' Society, Inc., 210 National City-East 6th Building, Cleveland 14, Ohio. Price to nonmembers, $1.75 (lower for quantities).

Although there are in the literature many references to the finishing of gray cast iron, no ambitious attempt has hitherto been made to bring together in one place and to correlate the available information on this subject. Mr. Burgess' effort in this direction has resulted in a comprehensive, informative and skillfully assembled review.

The favorable position which gray iron occupies with respect to cheapness, useful mechanical properties, castability, and machinability makes it an extremely important structural and engineering material. Although the finishing techniques which are applicable to steel can, in general, be applied to gray iron, the presence of uncombined graphite in the iron gives rise to special problems in the utilization of many metal-finishing methods, particularly those involving electroplating, hot-dipping, or metallic diffusion.

The booklet under review presents discussions of all the commercially useful coatings for gray iron. Obviously, it would not be possible in the scope of 66 pages to discuss all the operational details of the many processes. The author has described briefly the basic principles of each process, indicated the general nature of the necessary techniques, and discussed the applicability of the method to gray iron with special emphasis on the variations in technique which are peculiar to the application of the process to gray iron. For every method there are adequate references to easily available literature and commercial sources of information where operational and engineering details may be found.

The metallic coatings are divided into the following groups: sprayed, hot-dipped, hard-facing, cementation or diffusion, and electrodeposited coatings. The nonmetallic categories comprise organic finishes (paints, lacquers, enamels, etc.), vitreous or porcelain enamels, chemical conversion coatings, coloring, and cement linings and armor. In most cases the amount of space devoted to an individual method seems appropriate to the importance of the method.

The 45 figures which occupy a considerable portion of the text are mostly window dressing in that they contribute but little to the technical information.

The material in the booklet will appear as Chapter VIII of the forthcoming Gray Iron Handbook.

QUESTION BOX

readers' questions of general interest

Q. 117. What is the best way of stripping and replating Brittania metal, pewter and "white metal"?

A. All of the metals are in the tin, lead, antimony group and can be handled in the same manner.

For stripping of silver, use a 4 oz/gal sodium cyanide solution with 4-volt reversed current; for nickel stripping, the conventional reverse-current sulfuric acid strip. Refinishing can be done with pumice and lard oil on a low-speed buff or with some of the prepared cakes, if care is taken not to let the work get so hot that it melts. The plating cycle for silver is given in Q. 113 on p. 375 of the April, 1951 issue. The same cycle, up to and including the copper flash, is used prior to nickel plating.—F. K. SAVAGE.

Q. 118. We are having difficulty in meeting the salt-spray requirement of 24 hours without white corrosion on two parts that are barrel cyanide-zinc plated and then given an olive-drab conversion coating. On a ½ inch long screw with a ¼-inch diameter flat head the failure occurs in the head slot and at the base of the thread; on a half-circle band loop of 1-inch radius and ½-inch width the same difficulty is encountered in a deep cup-shaped recess in the enter. Can the difficulty be overcome by changing the cyanide-to-zinc ratio? Is it possible that the zinc plate strips when the contact in the barrel is broken?

A. It is true that zinc dissolves chemically when no current is flowing, and that would have the most severe effect, percentagewise, in a recess. If the ammeter (or the voltmeter) on the barrel shows severe fluctuations, you should clean or repair your barrel contacts or ask your barrel supplier to furnish you a different type of contact.

If that is not your difficulty, your first step is to make certain that the recesses are clean when the parts enter the plating solution and to improve the cleaning if necessary. Little or no plate deposits on an area while the zinc cyanide solution cleans it.

Your second step is to raise the free cyanide content or lower the solution temperature to improve the throw. Unfortunately, whatever is done in these directions will reduce the plating efficiency, and the change should not be greater than necessary. Any one of the changes will increase the difference between the anode and cathode efficiency, and an increase in cyanide content will cause more rapid chemical solution of the anodes. Hence, to maintain the solution composition after the change, you may have to remove some of the anodes.—K. B. SODERBERG.

Flexible and More Precise

THAN WITH HARD BURRS

Do cast or stamped parts you are finishing come to you with slivers, fins, rough edges, plugged holes, imperfect corners?

Look into the Lea Burring Method for fast and precise removal of such excess metal and straightening out of edges and surfaces. This method while used to some extent prior to World War II really came into its own when manufacturers were faced with really stiff specifications and close tolerances. The Lea Method helped many a company stay in war-contract business.

Since the war many companies retained the Lea Method of Burring in order to maintain high finishing standards. Now, there is an increasing demand for better preparation of surfaces on which finishing operations are to be performed. Now—as before—Lea is the method being adopted for removing burrs.

Our technical staff will be glad to help you make use of this proved method. Write in detail and, if possible, send us samples of pieces to be deburred for our recommendations.

Burring, Buffing and Polishing . . . Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions

THE LEA MANUFACTURING CO.
16 Cherry Avenue, Waterbury 20, Conn.
LEA MFG. COMPANY OF CANADA, LTD.,
370 Victoria Street, Toronto 2, Canada

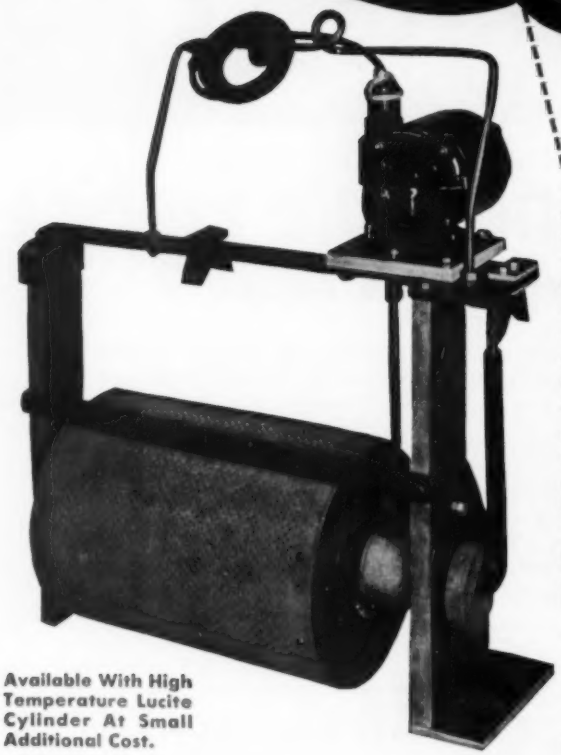
Manufacturers of Lea Compound and Learok, Industry's Quality Buffing Compounds for over Twenty-Five Years

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 619.

Faster, More Uniform Plating

LASALCO'S UTILITY BARREL PLATER OFFERS SPEED *PLUS* ECONOMY

Extremely versatile, Lasalco's Utility Barrel Plater can be used for plating small lots of varying grades and types of material, regardless of process, faster, more uniformly and at less cost than any other equipment in its price range. Check these important features:



Available With High Temperature Lucite Cylinder At Small Additional Cost.

- Can be hung in any plating tank on the cathode rod and operated from the nearest light socket.
- Easy to load and unload because of its extreme portability
- Nothing plates but the load—no "tree-up" on the cylinder
- Less dragout loss because barrel revolves as it is lifted from solution
- Hand shifting of cylinder is entirely eliminated
- Rugged, durable, long-life operation is guaranteed by its heavy canvas base Bakelite construction
- Specially designed, sturdy, geared-type motor
- Cylinder sizes: No. 1—Dia. 6" x 12" long; No. 2—Dia. 9" x 12" long

Hundreds of plating shops are finding Lasalco's Utility Barrel Plater a real time saver and profit-maker.

Write today for complete information.

LASALCO, INC.

2818-38 LASALLE STREET • GRAND 2990 • ST. LOUIS 4, MISSOURI

PROGRAM

38th Annual Convention

July 30 and 31, August 1 and 2, 1951

Hotel Statler, Buffalo, N. Y.

HOST

The Buffalo Branch

CONVENTION COMMITTEE AND BRANCH OFFICERS

Bert Kirchhoff
General Chairman
Member, Board of Managers

Wm. Fotheringham
Co-Chairman
Second Vice-President

Dr. C. J. Wernlund
Educational
Member, Board of Managers

Stanley Bush
Finance
Treasurer

H. A. Fudeman
Program

Anthony Nigro
House
President

Joan T. Wiarda
Co-Program and Publicity

W. D. Hart
Registration
Sergeant-at-Arms

B. P. Fortin, Jr.
Hotel Reservation
Secretary

Leon Nowak
Transportation
Third Vice-President

Mrs. Anthony Nigro
Ladies' Entertainment

Joseph Ruff
Picnic
Member, Board of Managers

James Moneypenny
Banquet
First Vice-President

Dr. A. A. Janis
Librarian

CITY OF BUFFALO
OFFICE OF THE MAYOR

JOSEPH MRUK
MAYOR

-: P R O C L A M A T I O N :-

WHEREAS, the general happiness, comfort, and satisfaction of our citizens depend on attractive and durable products which help to promote more leisure time, more enjoyment of that leisure time, and a higher standard of living; and

WHEREAS, many of our citizens are gainfully employed by local metalworking and metal-finishing industries which produce and market these products for the nation's benefit; and

WHEREAS, this community wishes to pay tribute to the importance of these activities to the growth and future accomplishments of its constituents,

NOW, THEREFORE, I, JOSEPH MRUK, Mayor of the City of Buffalo, do hereby designate July 30th, 1951, as official opening date of METAL FINISHING AND ELECTROPLATING WEEK coinciding with the opening day of the 38th annual convention of the American Electroplaters' Society in Buffalo, New York, sponsored by the Buffalo Branch of the American Electroplaters' Society, and call upon all departments of the city, its business and commercial organizations, civic clubs, and our citizens generally to take an active part in promoting the aims and objectives of this progressive and scientific program.

Joseph Mruk
Mayor

GENERAL PROGRAM

THE CONVENTION COMMITTEE has tried to prepare a program for your education and pleasure. The five Technical Sessions have been organized by the capable members of the Society's Editorial Board. The Social Program should prove most relaxing, yet not tiring. The Committee hopes that you will see and hear what you like—and like what you see and hear.

All Times Shown are Eastern Daylight Saving Time

All meetings and activities, unless otherwise noted, will be held at the Statler Hotel, Convention Headquarters.

SUNDAY, JULY 29, 1951

4:00 P.M. Mezzanine Lounge

REGISTRATION until 8:00 P.M. Hospitality Committee on hand to assist you

The registration fee of $15.00 will entitle each man to a book of tickets to be used for admission to the Technical Sessions and Social Activities listed in this program

Banquet-table reservations must be made no later than Wednesday, August 1, 11:00 A.M. First come—first scheduled

MONDAY, JULY 30, 1951

8:00 A.M. Mezzanine Lounge

REGISTRATION all day

9:30 A.M. Grand Ballroom

OPENING SESSION

Invocation—The Reverend Frank C. Mesle

Welcome to Buffalo—Joseph Mruk, Mayor

Greetings from the Buffalo Branch—Bert Kirchhoff, President and General Chairman

Keynote Address, "*Electrodeposition Researches at the National Bureau of Standards*", by Dr. William Blum, National Bureau of Standards, Washington, D. C.

12:00 Noon Terrace Room

EDUCATIONAL COMMITTEE LUNCHEON

12:15 P.M. Empire State Room

INTERNATIONAL FELLOWSHIP CLUB, 27th Annual Luncheon—for equipment and supply manufacturers, distributors and their representatives only

2:00 P.M. Grand Ballroom

FIRST NATIONAL SESSION, "*Engineering Aspects of Electroplating*"—Chairman, G. W. Jernstedt, Westinghouse Electric Corporation, East Pittsburgh, Pa.

"*Rinsing for Electroplating*", by R. J. Rominski and F. L. Clifton, General Motors Research Laboratories, Detroit, Mich.

Need for more study and control of rinsing; available types of rinse, and advantages and disadvantages of each; effect of harmful water impurities and methods for their removal; importance of proper rinsing.

"*Practical Application of Diaphragm Tanks in the Electroplating Industry*", by Ezra A. Blount, Products Finishing Magazine, Cincinnati, Ohio

Description of the three general types of diaphragm-tank installations, used primarily for high-speed copper and bright-nickel solutions, and their engineering features; listing of necessary accessory equipment; survey of diaphragm materials; showing of how the

G. L. NANKERVIS | A. P. MUNNING | A. L. BRAUN | C. BERRY | T. A. TRUMBOUR | R. HAZUCHA

I. F. C. OFFICERS

plater with a 5-gal tank may enjoy the advantages of the equipment just as easily as the plater with a 50,000-gal tank.

"*Methods of Heating and Temperature Control of Plating Solutions*", by W. E. Stadel and C. Civan, George L. Nankervis Company, Detroit, Mich.

Choice between internal heating coils and external heat exchangers; factors in the design of heat exchangers, including selection of materials; types of temperature-control means and their applications.

"*Advantages of Simplicity in the Electroplating of Automobile Bumpers*", by Donald H. Schantz, Michigan Bumper Corporation, Grand Rapids, Mich.

Detailed description of a plating sequence in commercial use for finishing automobile bumpers without the use of copper and cyanides; advantages—extreme simplicity, low cost, excellent adhesion of deposit; replating of chromium rejects without buffing; use of alternating current for electrocleaning.

8:30 P.M. Grand Ballroom — A NIGHT OF FOOD, FROLIC AND FUN, a contribution of our generous allies, *The International Fellowship Club*—Music, Dancing, Buffet served at 10:00 P.M.

TUESDAY, JULY 31, 1951

7:45 A.M. Cafe Rouge — EDUCATIONAL COMMITTEE BREAKFAST

9:00 A.M. Mezzanine Lounge — REGISTRATION—Banquet table reservations

9:00 A.M. Niagara Room — SECOND TECHNICAL SESSION, "*Preparation and Plating of Zinc Base Diecastings*"—Chairman, Dr. R. B. Saltonstall, The Udylite Corporation, Detroit, Mich.

"*The Shortest Way*", a movie, courtesy Doehler-Jarvis Corporation

"*Requirements of Die Castings for Plating*", by Glenwood J. Beckwith, Metallon Products, Inc., Los Angeles, Calif.

Design of articles for efficient polishing and plating; design of dies for high output and good surface characteristics; types of die-casting machines and their operation; composition of die-casting alloys and its effects.

"*Mechanical Finishing of Die Castings*", by M. R. Caldwell, Doehler-Jarvis Corporation, Grand Rapids, Mich.

Reasons for having to polish and buff die-castings prior to plating, including information about density and thickness of the "skin" of normal castings; methods of preparation of the surface demonstrated by slides, with explanations of how the equipment is operated and comparisons of the methods.

"*Chemical and Electrochemical Preparation of Die Castings for Plating*", by Earl W. Arnold, L. H. Butcher Company, Los Angeles, Calif.

Adhesion and appearance of electroplated coatings depend on removal of objectionable films without formation of harmful reaction products; precleaning in organic solvents, emulsion cleaners, alkaline soak cleaners; electrolytic cleaning and its control; types and choice of acid dips.

"*Electroplating Zinc Base Die Castings*", by Chester G. Borlet, United Chromium, Inc., Detroit, Mich.

Factors affecting electrodeposition as they pertain to successful operation of any plating system employed in the finishing of zinc-base die castings to a well-defined set of specifications; composition, current density, filtration, agitation.

12:00 Noon Buffalo Room — BRANCH SECRETARIES' LUNCHEON MEETING, courtesy Buffalo Branch

12:00 Noon Terrace Room — EDUCATIONAL COMMITTEE LUNCHEON

W. BLUM
G. W. JERNSTEDT, *Session Chairman*
R. J. ROMINSKI
F. L. CLIFTON
W. E. STADEL

C. CIVAN
D. H. SCHANTZ
R. B. SALTONSTALL, *Session Chairman*
G. J. BECKWITH
M. R. CALDWELL

3:00 P.M. Grand Ballroom

THIRD TECHNICAL SESSION, "*Open Forum on Substitute Finishes for Electroplating*"—Chairman, Dr. Walter R. Meyer, Enthone, Inc., New Haven, Conn.

"*Phosphate Coatings*", by Alfred Douty, American Chemical Paint Company, Ambler, Pa.

"*Chromate Treatments*", by Charles W. Ostrander, Allied Research Products, Inc., Baltimore, Md.

"*Black Oxide Coatings*", by Dr. Walter R. Meyer, Enthone, Inc., New Haven, Conn.

"*Clear and Pigmented Organic Coatings*", by Donald R. Meserve, Organic Coatings Division, United Chromium, Inc., Carteret, N. J.

"*Rust Preventive Oils and Waxes*", by A. W. Ackerman, F. E. Anderson Oil Company, Portland, Conn.

These short introductory talks will list available processes and materials, and will classify them according to their applicability as substitutes for electroplating processes on civilian goods. Tabular data will be distributed to the audience.

7:00 P.M. Buffalo Room

NATIONAL ASSOCIATION OF METAL FINISHERS, INC., Dinner Meeting

WEDNESDAY, AUGUST 1, 1951

7:45 A.M. Cafe Rouge

EDUCATIONAL COMMITTEE BREAKFAST

9:00 A.M. Mezzanine Lounge

REGISTRATION—Banquet-table reservations must be made by 11:00 A.M.

9:00 A.M. Grand Ballroom

FOURTH TECHNICAL SESSION, "*Some Practical Aspects of Plating Room Control*"—Chairman, John Acheson.

Canadian Hanson-Van Winkle Com- Ltd., Toronto, Canada

"*The Evaluation of Quality of Electrodeposits*", by Carl Durbin, Chrysler Corporation, Detroit, Mich.

A discussion of some of the properties of an electrodeposited coating which contribute to its quality; laboratory methods of evaluation of these properties for nickel-chromium coatings, including rapid tests that can be used in the production plating shop; presentation of limited data showing correlation with results of atmospheric exposure.

"*Operating Control for Optimum Plating Characteristics*", by R. O. Hull and J. B. Winters, R. O. Hull & Company, Rocky River, Ohio

Principles and practice of the technique of controlling plating baths for uniform deposit quality and continuous production; plating bath standards, and analytical and physical controls for each type of bath, with time cycles for keeping the baths within prescribed limits for good operation; the daily "foreman check" for anticipation of trouble before it can interfere with production; differences between plants with continuous production and job or contract shops with variable production with respect to types of baths and control methods.

"*Some Practical Considerations of Current Distribution*", by Dr. Ralph A. Schaefer and Harry Pochapsky, Cleveland Graphite Bronze Company, Cleveland, Ohio

The importance of minimum and maximum thickness and the spread between the two; improvement of quality by application of known concepts of current distribution, some of which are not recognized as having a bearing on the problem, especially when metal distribution is a secondary factor; effect of organic and inorganic addition agents in the physical, chemical and electrical factors which make up "throwing power".

"*Nickel Plating with Insoluble Anodes*", by Dr. W. A. Wesley, D. S. Carr and E. J. Roehl, The Interna-

E. W. ARNOLD
C. G. BORLET
W. R. MEYER, *Session Chairman*
A. DOUTY
C. W. OSTRANDER

D. R. MESERVE
A. W. Ackerman
J. ACHESON, *Session Chairman*
C. DURBIN
R. O. HULL

tional Nickel Company, Bayonne, N. J.

Advantages of an insoluble-anode process for nickel plating of metal strip and wire, rolls, and inside of tubes and for nickel electroforming of screens; an electrolytic regenerating process for replenishing, cheaply and with good control, the nickel content of a chloride-free nickel plating solution, in which the electrolyte is circulated continuously through the plating cell; use of periodic reversal of the current in the regenerating cell; the mechanism which makes this effective.

9:00 A.M. Orchard Park Country Club — INTERNATIONAL FELLOWSHIP CLUB, Golf Tournament, Orchard Park Country Club, Orchard Park, N. Y. Bus transportation available—please fill out card in Registration Book

11:30 A.M. Parlor A Mezzanine Floor — NATIONAL ASSOCIATION OF METAL FINISHERS, INC., Board of Directors Meeting

12:15 P.M. — LUNCHEON — ANNUAL PICNIC — BALL GAME, EAST VS. WEST. Buses will leave Delaware Avenue door of Hotel Statler for trip to Automobile Club, Clarence, N. Y.

Evening — FREE

THURSDAY, AUGUST 2, 1951

7:45 A.M. — COMBINED BREAKFAST, A. E. S. Research Committee and Educational Committee

9:00 A.M. Niagara Room — FIFTH TECHNICAL SESSION, "*Report on A. E. S. Research Program*"—Chairman, Guy M. Cole, Ternstedt Division, General Motors Corporation, Detroit, Mich.

"*A New Degreasing Evaluation Test—The Atomizer Test*", by Dr. Henry B. Linford, Columbia University, New York City

Dependence on the receding contact angle of currently used degreasing-evaluation tests, namely, the common water-break test and Spring's spray-pattern test, which allows quantitative estimations of water-break; bridging of small oily and greasy areas in the common water-break test, in which the panel is flooded with an excess of water; absence of these limitations in a newly developed atomizer test in which water is sprayed against a previously dried panel; higher sensitivity of the new test, in which clean areas show a continuous film of water, heavily soiled areas show very fine droplets of water, and lightly soiled areas show large water droplets, than of the spray-pattern (water break), the fluorescent-dye, the copper-replacement, or the ferrocyanide tests, as shown by extensive testing.

"*How the Plating Industry Will Benefit from Research on Metal Cleaning*", by E. T. Candee, Lea Manufacturing Company, Waterbury, Conn.

Abstract nature of much research work, making it difficult for management to justify the expense; detailed discussion of how A. E. S. Project No. 12 was laid out and is being conducted; benefits that will accrue to the the industry.

"*Highlights of the A. E. S. Research Program*", by Dr. Donald Price, Oakite Products, Inc., New York City

Summary of the progress and accomplishments of the past year.

2:00 P.M. Niagara Room — FINAL BUSINESS MEETING OF THE SOCIETY

7:00 P.M. Grand Ballroom — ANNUAL BANQUET—Roast Beef, Good Music, Dancing, Drawing for Hanson-Van Winkle-Munning Company's Prizes, Gifts

J. B. WINTERS
R. A. SCHAEFER
W. A. WESLEY
D. S. CARR
E. J. ROEHL

G. M. COLE, *Session Chairman*
H. B. LINFORD
E. T. CANDEE
D. PRICE

LADIES' PROGRAM

The Buffalo ladies have tried to prepare the prize-winning recipe for the busiest and gayest Convention ever

Parlor G on the Mezzanine Floor will be the ladies' headquarters during the Convention

All Times Shown are Eastern Daylight Saving Time

All meetings and activities, unless otherwise noted, will be held at the Statler Hotel, Convention Headquarters

SUNDAY, JULY 29, 1951

4:00 P.M. Mezzanine Lounge

REGISTRATION until 8:00 P.M. Hospitality Committee on hand to assist you

The Registration Fee of $15.000 will entitle each lady to a book of tickets to be used for admission to the activities listed in this program

Banquet-table reservations must be made no later than Wednesday, August 1, 11:00 A.M. First come—first scheduled

MONDAY, JULY 30, 1951

8:00 A.M. Mezzanine Lounge

REGISTRATION all day

12:00 Noon Niagara Room

GET-ACQUAINTED-AND-RENEW-ACQUAINTANCE LUNCHEON

8:30 P.M. Grand Ballroom

NIGHT OF FOOD, FROLIC AND FUN, a contribution of our generous allies, The International Fellowship Club. Music, Dancing, Buffet served at 10:00 P.M.

TUESDAY, JULY 31, 1951

10:00 A.M.

TRIP TO NIAGARA FALLS—ON TO CANADA. Bring identification to prove citizenship

Aunt Ella Society Luncheon, General Brock Hotel, Niagara Falls, Canada, sponsored by Oakite Products, Inc. David X. Clarin, host, leading and only man. Please remind friends, husbands to make banquet-table reservations

WEDNESDAY, AUGUST 1, 1951

12:15 P.M.

LUNCHEON—ANNUAL PICNIC—Prizes and surprises. Buses will leave Delaware Avenue Door of Hotel Statler for trip to Automobile Club, Clarence, N. Y.

THURSDAY, AUGUST 2, 1951

11:00 A.M. Empire State Room

TECHNICAL SESSION FOR THE LADIES. Dr. R. B. Saltonstall, The Udylite Corporation, will divulge a number of platers' secrets—for ladies only

Luncheon for the Ladies, sponsored by The Udylite Corporation. Professsor Saltonstall will be our host

7:00 P.M. Grand Ballroom

ANNUAL BANQUET—Good Food, Good Music, Dancing, Drawing for Hanson-Van Winkle-Munning Company prizes, Gifts for the Ladies

You will find tickets in your registration book

Souvenirs by Detroit Chemical Specialities Company, Detroit, Mich.; J. J. Siefen Company, Detroit, Mich.; Wyandotte Chemicals Corporation, Wyandotte, Mich.; Playing Cards—the traditional gift of Green Electric Company, New York City

ACKNOWLEDGEMENT

The Convention Committee expresses its sincere appreciation and thanks to the many manufacturers of plating, processing and polishing equipment and supplies who so generously aided in financing the Convention.

Acme Manufacturing Company, 1645 Howard St., Detroit, Mich.
Advance Polishing Wheels Company, 844 W. 49th Place, Chicago, Ill.
Agate Lacquer Manufacturing Company, Inc., 11–13 43rd Rd., Long Island City, L. I.
Alsop Engineering Corporation, 494 Bright St., Milldale, Conn.
Beacon Supply Company, 110 Marginal St., Chelsea, Mass.
The Buckeye Products Company, 7020 Vine St., Cincinnati, Ohio
The Buckingham Products Company, 14100 Fullerton Ave., Detroit, Mich.
Williamsville Buff Division, The Bullard Clark Company, Danielson, Conn.
Canton Platers Supply Company, 114 Warner Rd., Canton, Ohio
The Chemical Corporation, 54 Waltham Ave., Springfield, Mass.
F. L. & J. C. Codman Company, Rockland, Mass.
The S. A. Day Manufacturing Company, 1483 Niagara St., Buffalo, N. Y.
Detroit Chemical Specialties, Inc., 101 S. Waterman St., Detroit, Mich.
The Diversey Corporation, 1820 Roscoe St., Chicago, Ill.
E. I. duPont de Nemours & Company, Inc., Wilmington, Del.
The Egyptian Lacquer Manufacturing Company, P. O. Box 444, Newark, N. J.
W. M. Fotheringham, 975 Niagara St., Buffalo, N. Y.
The Grav-I-Flo Corporation, 400 Norwood Ave., Sturgis, Mich.
Hanson-Van Winkle-Munning Company, Matawan, N. J.
Jacob Hay Company, 4014 W. Parker Ave., Chicago, Ill.
J. Holland & Sons, Inc., 274 S. 9th St., Brooklyn, N. Y.
Industrial Filter & Pump Manufacturing Company, 5906 Ogden Ave., Chicago, Ill.
Kocour Company, 4802 S. St. Louis Ave., Chicago, Ill.
Kraft Chemical Company, 917 W. 18th St., Chicago, Ill.
Howard J. Lackey, Jr., 383 Brannan St., San Francisco, Calif.
Lasalco, Inc., 2818 LaSalle St., St. Louis, Mo.
The Lea Mfg. Company, Waterbury, Conn.
Charles F. L'Hommedieu & Sons Company, 4521 Ogden Ave., Chicago, Ill.
Maas & Waldstein Company, Newark 4, N. J.
MacDermid, Inc., Waterbury, Conn.
W. D. MacDermid Chemical Company, Bristol, Conn.
Magnuson Products Company, 59 Court St., Brooklyn, N. Y.
The Mandersheid Company, 810 W. Fulton St., Chicago, Ill.
The Matchless Metal Polish Company, 840 W. 49th Place, Chicago, Ill.
Michigan Buff Company, 3503 Gaylord Ave., Detroit, Mich.
The Mitchell-Bradford Chemical Company, 2446 Main St., Stratford, Conn.
Moore Business Forms, 330 University Ave., Toronto, Ontario
George L. Nankervis Company, 19255 W. Davison Ave., Detroit, Mich.
National Sherardizing & Machine Company, 858 Windsor St., Hartford, Conn.
Oakite Products, Inc., 22 Thames St., New York, N. Y.
F. D. Pace Company, 69–73 Scribner Ave., Grand Rapids, Mich.
Plating Service Company, 4014 Parker Ave., Chicago, Ill.
Pol-O-Plate Products, 2000 W. 14th St., Cleveland, Ohio
Polykote, Inc., 446 Genesee St., Buffalo, N. Y.
Promat Division, Poor & Company, 851 Market St., Waukegan, Ill.
Rapid Electric Company, 2881 Middletown Rd., Bronx, N. Y.
Donald Rice, 235 W. Delavan Ave., Buffalo, N. Y.
The Schaffner Manufacturing Company, Schaffner Bldg., Emsworth, Pittsburgh, Pa.
J. J. Siefen Company, 5657 Lauderdale Ave., Detroit, Mich.
Standard Plating Rack Company, 19–25 N. Paulina St., Chicago, Ill.
Frederic B. Stevens, Inc., Detroit 16, Mich.
Sulphur Products Company, Inc., Greensburg, Pa.
The Udylite Corporation, Detroit 11, Mich.
Wagner Bros., Inc., 481 Midland Ave., Detroit, Mich.
Western New York Metal Finishing Association, Buffalo, N. Y.
Whitfield Chemical Company, Box 3956, Detroit, Mich.

from LITTLE ACORNS

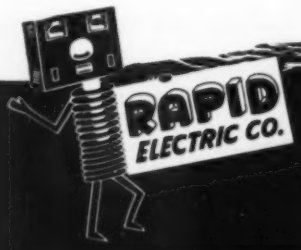
A FEW SHORT YEARS AGO . . . OUR FIRST SELENIUM RECTIFIER—A BENCH MODEL, CAPACITY 50 AMPERES

On the occasion of the Electroplaters' 38th Annual Convention, we take this opportunity to thank the members of the industry for the confidence they have placed in us and our products.

We pledge ourselves to maintain the high standards of quality and service which you have come to associate with RAPID ELECTRIC rectifiers and controls.

To-day

STOCK MODELS UP TO 5000 AMPERES — CUSTOM-BUILT UNITS FOR YOUR SPECIAL NEEDS



RAPID ELECTRIC COMPANY

DESIGNERS AND MANUFACTURERS OF SELENIUM RECTIFIERS AND ASSOCIATED EQUIPMENT FOR THE ELECTROPLATING INDUSTRY.

2881 MIDDLETOWN ROAD, NEW YORK 61, N. Y.

OUR DISTRIBUTORS JOIN US IN THIS MESSAGE

CLINTON SUPPLY COMPANY
110-112 S. Clinton St., Chicago 6, Ill.

THE PLATING PRODUCTS CO.
352 Mulberry Street, Newark 2, N. J.

COPPER PLATED ART
235 W. Main Street, Los Gatos, Calif.

BELKE MANUFACTURING COMPANY
947 North Cicero Avenue
Chicago 51, Ill.

TECHNIC INC.
39 Snow Street, Providence 3, R. I.

ELECTROPLATERS SUPPLY CO.
7426 Tioga Street, Pittsburgh 8, Pa.

SPECIAL CHEMICALS CORP.
30 Irving Place, New York 3, N. Y.

ANNUAL REPORTS OF OFFICERS

of the

American Electroplaters' Society

PRESIDENT'S REPORT

Neill

According to time-honored custom of my predecessors, it behooves me to render to my fellow-members an account of my stewardship, with possibly a sage dissertation on the "whither are we drifting" theme, including lengthy advice as to methods of accelerating the drift, or stemming the tide, whichever seems to be most appropriate at the moment.

Frankly, the accomplishments of one person in the organization are usually of little note. Yet the overall picture shows a definite advance toward some as yet not too well defined goal. We all feel the movement to be forward and believe that it shall continue so. Every President's administration starts out with objectives left from previous years, some of which, if he has put in his complete complement as an Executive Board member, he has helped to formulate, and which are still short of accomplishment. One of those objectives has been the advancement of the Society into new territories, while continuing to extoll the advantages of membership in those areas where Branches are already established. This year the opening of a vast new territory in the Southwest has become an accomplished fact. Credit for this must justly go to Past President A. W. Logozzo, Executive Secretary A. K. Graham and R. M. Shock, Secretary of the National Association of Metal Finishers, all of whom made visits to Texas to assure the success of the venture. Membership Chairman F. J. MacStoker also did what was needed to produce the desired result, but most important is the realization that there was a group of people in that region who thought enough of the advantages of membership to strive for it and attain it.

In the field of long-range development, we saw the Ohio River Valley Water Sanitation Commission rise from the planning state to smooth operation, with a section within it, known as the Metal Finishing Action Committee, actively formulating plans, assembling data and cooperating with similar action committees for the purpose of preserving the natural beauty and usefulness of one of our most valuable natural resources, our inland waterways, through the abatement of stream pollution. I have served as Chairman of the Sub-Committee on Standard Methods of Analysis, and feel that the Society's contribution to this effort has not been small. Results of our research projects have demonstrated their enduring value in an effort like this, as the information we were able to assemble from their reports has been of great help. In addition, the scope of Project No. 2 has been modified to specialize on problems yet to be solved in the field of waste-solution analysis. I feel certain that the efforts of the Metal Finishing Action Committee, the Research Committee and the Ohio River Valley Water Sanitation Commission toward the minimizing of stream pollution are going to be successful, and fully believe that the result will be of great economic value to all of us. Mr. Walter Pinner, an A. E. S. Past President, is Chairman of the Metal Finishing Action Committee, and several other prominent members of our Society are also taking part. So here again, we find a group within our membership willing to do what it takes for the advancement of our Society and the common good.

In the field of education, the Executive Board has long been aware of a need for some kind of home-instruction course in electroplating for those who are unable to advance their knowledge of the science by more formal means. Efforts are being made to make such a course available to our members. The need is certainly present, and I believe we should satisfy it. PLATING continues to offer a wealth of interesting and informative papers on the various phases of electroplating and allied subjects.

Financially, the Society will finish the year in reasonably good shape. The magazine has made money. As in years past, a good portion of it will go toward meeting the obligations of the Society. This, in my opinion, is not exactly sound business policy. I believe a change in that policy is desirable, but it can only be accomplished by the membership. The advance of the A. E. S. from Boston in 1941 to Buffalo in 1951 has been great, with assets going from $14,952.00 in 1941 to $141,568.00 today. That is something to point to with pride. However, I don't feel it represents the best we can do. It is my belief that if the activities of the Society were wholly self-supporting, our assets would be much larger, and we would be in a position to realize an ambition which I feel all of us entertain.

In every organization's life, just as in every man's, there comes a time when it should have a home of its own. That time could have been here for us, but it is still not too late to commence to accumulate the funds that will make such an ambition an accomplished fact. The plan envisions a dignified, though utilitarian establishment which could be partially self-supporting, in the beginning by the rental of space to other organizations. As we expand, we could add facilities for the solution of those everyday problems with which our members are beset, at a cost considerably less than they would have to pay elsewhere. Such facilities would offer an excellent opportunity for training promising young recruits for our industry. In other words, it would embody all the things which make a home, a place to point to with a feeling of pride and a sense of accomplishment. It is still only a dream, but if enough of us dream the same dream, and if at the same time we start to work out practical plans for its accomplishment, I believe it is one that can come true. It is certainly worth thinking about.

I suppose that every President comes to the end of his term with a little feeling of disappointment, a feeling that there was so much to accomplish, so much that he was capable of accomplishing, only to find in the last analysis that there are a great many of those things still left for the future. I have one consolation: I believe the future is bright, and we shall continue to go forward.

In conclusion, may I say that I have considered it a great honor and privilege to be able to serve you and the American Electroplaters' Society, and I sincerely thank you for the opportunity.

WILLIAM J. NEILL

FIRST VICE-PRESIDENT'S REPORT

Nixon

It is our privilege as well as our problem as an educational society to deal with both the technical and the practical aspects of processes which are in the aggregate increasingly receiving recognition as an industry. A number of developments have been shaping during the past year with respect to the conduct of our overall educational program which indicate an increasing awareness among our members of its importance and which at the same time make it clear that the interests and needs of our members are diverse.

1. A need has been expressed for an elementary correspondence course in electroplating. Such a course is now being reviewed by the Editorial Board; it is expected that it, or some other, will be sponsored by the Society in the near future.

2. There is a demand for more papers of a practical nature. Not easy to meet, the expressed need is receiving increasing attention. Not the least of the difficulties in this connection is a matter of definition: What is a practical paper? Ideally, perhaps, a practical paper is one that contains information which can be applied immediately and directly for the solution of a manufacturing problem, as the purchase of a ready-made suit solves an apparel problem. If this be the measure, however, then no paper is likely to be judged practical by more than a few people. Perhaps more reasonable, a practical paper may be likened to a bolt of cloth from which we as tailors fashion a suit to our own liking. Sometimes, unfairly I think, a paper is condemned as impractical because it contains unfamiliar language; whereas it is the writer's obligation to marshal his thoughts carefully and to express them clearly, it is the interested reader's obligation to make a studious effort to understand him. It must be recognized that year by year our business is becoming more complex, more technical.

3. Our need for an electroplaters' handbook is more evident than ever. Steps have been taken during the past year to find a workable means for achieving this objective. If the necessary monies can be made available, we may expect to make a real start reasonably soon.

4. As one result of our two-year old Public Relations program, the desirability of selling plating to the general public is gaining further recognition. The strengthening International Fellowship Club has taken over this phase of the work; increasingly, it is hoped, you will see favorable mention of plating in general-interest magazines and in the press. This shift permits the Society to concentrate on another, equally important phase of public relations, the selling of A. E. S. itself—to ourselves first. Public relations, like charity, it is felt, begins at home.

5. All to the good, there is evidence that our Branches are giving more attention to the reception and handling of guest speakers. Whereas the size of the audience is important, of course—every effort should be made to get a good turnout—no Branch need apologize because it is small if those who attend meetings are cordial and interested. Give the subject of the evening thought before the meeting so that the discussion may be both lively and significant; it is a rare speaker who doesn't like to leave a meeting feeling that he too has learned something.

There is one matter in this connection to which some Branches can to good effect give more attention—*publicity*. It is important that reports of all meetings be carefully prepared and sent as soon as possible to PLATING and trade papers for publication. Speakers are motivated almost entirely by a desire to generate good will for themselves and for their companies; such notices are tangible evidence that their efforts have been successful at least to a degree. In addition, local press notice of meetings should be sought; if obtained, be sure that your speaker has a copy of the paper. Our Public Relations Committee publicity man, Mr. S. E. Sangster, has some advice on this:

"My suggestion would be that the secretary or librarian or some member of the board of each local Branch be charged with the official chore of preparing a brief 'release' for each monthly meeting. This should, in each instance, give the date, time and place of the monthly meeting and the name of the speaker, who he is, and what he will discuss. Preferably, it should be accompanied with a suitable 5 x 7- or 8 x 10-inch photoprint of the speaker.

"Each such release and accompanying pix of the feature speaker should be placed with the proper editorial member of the local paper (or papers) at least a week prior to the scheduled monthly meeting.

"Each local secretary or publicity man handling this specific activity should make it his duty to establish personal contact with the local paper (or papers) and to know the proper member of each local paper through whom his publicity must be handled. In larger cities, it might be the man editing an industrial or business page. Where there is no such breakdown of editorial duties, then make the contact with the city editor. Good press relations are most important—it might be well to invite occasionally a member of the editorial staff of the local press to attend a monthly luncheon or dinner to meet the executive group and to gain some idea of the Branch's activities."

I am appreciative of the many courtesies extended me as I have sought to meet the obligations of my office during the year. It has been a pleasure to serve you.

C. F. NIXON

SECOND VICE-PRESIDENT'S REPORT

MacStoker

The membership campaign for the year, assigned to the Second Vice-President, was fraught with uncertainties, and not until the latter part of the fiscal year was the membership turnover on the credit side.

We have forty-four Branches in the Society, not including the two groups in the Dallas-Fort Worth and Houston areas of Texas which have been granted temporary charters. Three of our Branches are in Australia, and two in California. The remaining thirty-eight are confined to the northeastern part of the country and make up the preponderance in numbers of both Branches and members.

As of March 31, 1951, the end of the competition as well as the fiscal year, twenty-nine Branches of the forty-four had increased their membership. The Grand Rapids, Mich., Branch led the first group of Branches, with large membership, with a net gain of 16.7 per cent, followed by the Milwaukee and Chicago Branches with 14.9 and 10.1 per cent, respectively. The Montreal, Canada, Branch led the second group with a 14.0 per cent net gain, followed by Melbourne, Australia, Branch with 13.1 per cent and the Buffalo Branch with a 10.4 per cent gain. In the third group, of smaller Branches, the Allentown-Reading Branch led with a net gain of 16.7 per cent, followed by the Columbus Branch with 12.8 per cent, and the St. Joseph Valley Branch with 8.3 per cent net gain. Six of our Branches, some old, some new, had a 10–16 per cent net loss over the year.

Necrology

The following members have died during the year. Many of them contributed greatly to the advancement of the Society, which, with their Branches and friends, mourns their passing:

Boston Branch: William Lawson
Bridgeport Branch: Thomas Barnes, Jr.
Chicago Branch: C. Fowler, Edward Wilk, L. G. Van de Bogart
Cincinnati Branch: T. P. McHugh
Dayton Branch: Robert G. Suman
Detroit Branch: Gene Lyons, James A. Seeman, C. E. Heussner
Hartford Branch: Carsten A. Kohrs
Jackson-Lansing Branch: J. M. Stewart
Los Angeles Branch: Frank C. Rushton, Charles A. Russill, C. G. Spence
Melbourne Branch: F. A. Prowse
Milwaukee Branch: N. F. Gerke, R. M. Goodsell, Daniel Wittig, E. C. Yaeger
New Haven Branch: John C. Oberender, Robert T. Sammet
Providence-Attleboro Branch: James L. Smith
St. Louis Branch: H. H. Williams
Saginaw Valley Branch: Richard Blake
Sydney Branch: R. G. Pope
Syracuse Branch: George Kushner
Waterbury Branch: Earle V. Ball, Norman Tice

None of these were of the first group, of large Branches. Six of our Branches had a net loss of from 5–10 per cent each, and again none of these were in the first group.

There are many new members belonging to the temporary-chartered Branches in the Dallas-Fort Worth and Houston, Texas, areas, and we have 115 members-at-large, or a 11.1 per cent increase over last year. The total membership as of March 31, 1950 was 5,252. This year the Society gained 674 new members and the net gain was 140 members, or 2.7 per cent over last year, with a grand total of 5,392 members as of March 31, 1951.

It has not been a discouraging year, at least relative to membership numbers, and promise has been given for greater gains through the formation of Branches in Texas and potential ones elsewhere. There is much opportunity for organization west of Illinois and Indiana, south of the Mason-Dixon Line, and in such North Pacific Coast cities as Seattle, Spokane, and Portland, Oregon. The formation of the Texas Branches is the consummation of a survey made by the Society and of organizational visits by Executive Secretary A. K. Graham, followed by speaking engagements undertaken by Mr. A. Logozzo, our Past President, at these new Branches. The membership campaign is and should be one of continuity from year to year, following a long-term plan. Steady, progressive growth is its goal.

Your Second Vice-President attended all meetings of the Executive Board, several Regional Meetings and Branch visitations when possible, and did what he could to expedite the business of the Society and President Neill's administration.

I should like to express my appreciation for the courtesy and help extended me by my fellow members of the Executive Board, and for the consideration and cooperation shown me at the Branch meetings and by many of the individual members of the Society.

FRANKLYN J. MACSTOKER

CHANGES IN ACTIVE MEMBERSHIP 1950–1951

BRANCH	Membership April 1, 1950	Elected	Reinstated	Transferred In	Transferred Out	Resigned	Suspended	Dead	Net Gain	Membership March 31, 1951
Adelaide	72	7	..	..	..	4	10	..	− 7	65
Allentown-Reading	36	7	..	..	..	..	1	..	+ 6	42
Baltimore-Washington	85	8	4	2	..	3	9	..	+ 2	87
Boston	142	19	5	3	1	1	15	1	+ 9	151
Bridgeport	155	9	..	1	2	3	7	1	− 3	152
Buffalo	77	13	..	..	..	..	5	..	+ 8	85
Chicago	371	56	4	3	2	6	14	3	+38	409
Cincinnati	87	7	4	3	1	3	8	1	+ 1	88
Cleveland	195	37	3	1	1	6	24	..	+10	205
Columbus	47	3	1	3	..	..	..	..	+ 7	54
Dallas-Fort Worth	..	24	..	7	..	..	..	..	+31	31
Dayton	93	1	..	1	1	6	5	1	−11	82
Detroit	490	60	..	3	7	11	35	3	+ 7	497
Grand Rapids	141	12	13	..	1	1	..	..	+23	164
Hamilton	23	1	..	1	..	..	..	..	+ 2	25
Hartford	132	12	7	1	1	8	5	1	+ 5	137
Houston	..	20	..	5	..	..	..	..	+25	25
Indianapolis	91	16	2	..	3	3	11	..	+ 1	92
Jackson-Lansing	57	4	..	1	..	4	5	1	− 5	52
Lancaster	62	5	..	..	2	2	3	..	− 2	60
Los Angeles	199	33	2	5	2	14	9	3	+12	211
Louisville	26	3	..	..	1	2	3	..	− 3	23
Melbourne	111	22	..	1	..	7	..	1	+15	126
Milwaukee	124	31	1	1	..	2	8	4	+19	143
Montreal	68	12	3	..	1	2	3	..	+ 9	77
Newark	238	16	1	1	2	5	10	..	+ 1	239
New Haven	106	10	2	..	1	..	7	2	+ 2	108
New York	280	27	2	2	1	8	23	..	− 1	279
Philadelphia	192	32	1	2	1	7	18	..	+ 9	201
Pittsburgh	142	6	..	1	1	2	14	..	−10	132
Providence-Attleboro	112	3	..	..	..	6	8	1	−12	100
Rochester	105	10	7	2	2	2	32	..	−17	88
Rockford	65	15	..	1	..	..	14	..	+ 2	67
Saginaw Valley	64	5	2	..	..	2	11	1	− 7	57
St. Joseph Valley	66	11	4	..	1	1	8	..	+ 5	71
St. Louis	97	16	1	1	2	1	6	1	+ 8	105
San Francisco	66	18	..	..	..	..	19	..	− 1	65
Southeastern	54	4	1	..	..	5	6	..	− 6	48
Springfield	51	4	2	2	..	1	4	..	+ 3	54
Sydney	109	8	3	..	..	6	20	1	−16	93
Syracuse	84	17	..	..	..	2	13	1	+ 1	85
Toledo	49	3	9	..	..	..	16	..	− 4	45
Toronto	125	7	3	..	3	5	6	..	− 4	121
Twin City	71	3	..	..	..	2	6	..	− 5	66
Waterbury	125	8	..	1	2	2	2	2	+ 1	126
Western Ontario	23	..	..	..	..	..	..	..	..	23
At Large	108	29	4	1	8	3	11	..	+12	120
In Transfer	36	..	..	..	6	..	14	..	−20	16
Total	5,252	674	91	56	56	148	448	29	+140	5,392

THIRD VICE-PRESIDENT'S REPORT

Swift

The Third Vice-President has no regularly assigned duty other than that of Chairman of the Exhibits Committee for the Annual Meeting. Work for the Los Angeles Convention had started and was progressing admirably when it was suddenly terminated due to reasons beyond our control.

Attention was then transferred to the Buffalo group, but through an unintentional error Branch Exhibits were omitted from the plans submitted to the Buffalo Committee by the National Office. This error was discovered at the March Board meeting, and plans were reinstituted for Exhibits at the Buffalo Convention. Unfortunately, arrangements for space had not been pressed soon enough, and no more space was available at the Hotel Statler; as a result, plans for the Exhibits program had to be dropped. It is an unfortunate change from our custom of having an excellent collection of plated products, but unavoidable because of the late shift in locale.

Your Third Vice-President has attended all Executive Board meetings to date, in Boston, Philadelphia, Detroit, Chicago and New York, and plans to attend the remaining ones scheduled at Buffalo in May and July.

Visits have been made to Providence-Attleboro, New York and Newark Branches, as well as to the New England Regional Meeting at New Haven and of course, the Boston Annual Meeting. Detroit and Chicago meetings were attended in conjunction with the Board meetings in those cities.

Every effort has been made to promote the Society and support the administration of President William J. Neill. I appreciate the helpfulness and courtesy of the other Board members toward this freshman member and have encountered the same attitudes among both the individual members and the Branches.

GEORGE P. SWIFT

EXECUTIVE SECRETARY'S REPORT

Graham

INCOME AND EXPENDITURES

The Auditor's Report of the General Fund of the Society for the fiscal year, April 1, 1950 to March 31, 1951, has been changed from previous years by separating from the Society account the Convention account and the Industrial Finishing Exposition account. For obvious reasons these changes will be continued in the future in order that the true picture of income and expenses incident to handling Conventions and the Industrial Finishing Exposition will be more readily apparent to the members.

The Society account shows a total income of $24,908.66, against a total expenditure of $31,032.02. The excess expenditure over income for operation of the Society is $6,123.36. Because $3,600.00 was appropriated from the General Fund (Reserve) for the public relations activities, the true excess of expenditures over income is $9,723.36.

The Society's income and expenditures for the year ending March 31, 1951 are presented in Figs. 1 and 2. The income from all sources was $4.53 per member, including an appropriation from reserve for promotional and educational activities amounting to $0.66 per member. The total expenditure was $5.67 per member. The largest single item was $1.94 per member for the business and technical proceedings of the Boston Convention, the latter comprising 89.3 per cent of the amount. The Society's expenditure exceeded the income by $1.14 per member. If one adds the $0.66 income per member appropriated from reserve, the true excess expenditure over income for the year is $1.80 per member, as shown in Fig. 3.

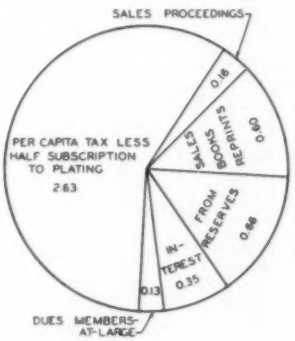


Fig. 1. Society income in dollars per member during the fiscal year 1950-1951. Total, $4.53

The publication account was also audited as part of the General Fund of the Society and reported to the Executive Board. The total income from PLATING for the year ending March 31, 1951 was $19.80 per member and exceeded the total expenditure by $4.20 per member, as shown in Fig. 4. Inasmuch as the Society's expenditure exceeded the income by $1.14 per member, the net "profit" from the combined publication and Society operations was $3.06 per member. This raises the Society's assets (reserve) to $16.45 per member, which is about 60 per cent of the minimum safe working reserve recommended by the Executive Board.

BRANCH ACTIVITIES

An indication of the activity of the Branches of the Society is best obtained by reviewing their performance with respect to the following items:

Out of forty-four Branches (not including the temporary Branches of Houston and Dallas-Fort Worth), twenty-six now have Branch libraries, forty have appointed Research Committee representatives, nineteen have adopted Branch By-Laws, twenty-six have compiled historical data on the Branch.

There were 290 Branch News items published in PLATING during the fiscal year, representing an average of 6.5 items for each of the forty-four branches as compared to 6.4 items in the pre-

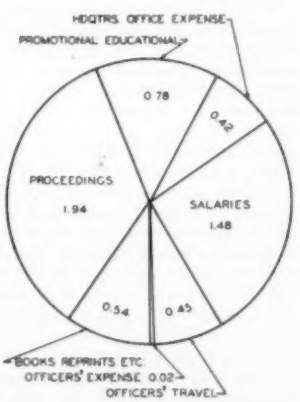


Fig. 2. Society expenditures in dollars per member during the fiscal year 1950-1951. Total, $5.67

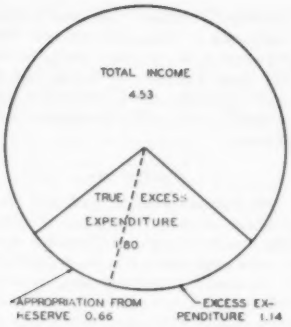


Fig. 3. Statement of the Society income and expenditures in dollars per member during the fiscal year 1950-1951. The true excess expenditures of $1.80 were made up by budgeted appropriation from reserve ($0.66) and by profit from PLATING *magazine ($1.14)*

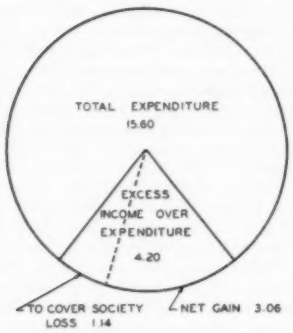


Fig. 4. Statement of PLATING *income and expenditures in dollars per membership during the fiscal year 1950-1951*

vious year. These items serve as a recorded history of the Branches' activities and are required by the Constitution and By-Laws. It is hoped that a further improvement can be shown during the fiscal year 1951–1952. A comparison of the last two years is shown in Table I.

TABLE I. BRANCH NEWS ITEMS

Fiscal Year	1949–1950	1950–1951
Number of Branches	44	44
10–18 Items	6	11
5–9 Items	25	17
1–4 Items	12	14
0 Items	1	2

The Executive Secretary spoke before the Houston and Dallas-Fort Worth

AUDITOR'S REPORT

April 9, 1951.

THE SUPREME SOCIETY OF
THE AMERICAN ELECTROPLATERS' SOCIETY, INC.
JENKINTOWN, PA.

Gentlemen:

We have examined the balance sheets of the General Fund and Research Fund of the Supreme Society of The American Electroplaters' Society, Inc., as of March 31, 1951, and the related statements of Income and Expenses of said funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances, with the exception that we did not confirm the amounts due from dues of members at large and from sales of branch supplies.

The accompanying balance sheet and statement of income and expenses of the General Fund are exclusive of certain accounts as more fully described in Notes A and B attached thereto.

In our opinion, the accompanying balance sheets and statements of income and expense, except as indicated above, present fairly the financial position of The Supreme Society of The American Electroplaters' Society, Inc., as of March 31, 1951, and the income and expenses for the year then ended.

Very truly yours,

LAURENCE E. BROWN & COMPANY
Certified Public Accountants

Philadelphia, Pa.

FINANCIAL STATEMENT OF THE SUPREME SOCIETY OF THE AMERICAN ELECTROPLATERS' SOCIETY, INC.

General Fund

BALANCE SHEET, MARCH 31, 1951

ASSETS		
Demand Deposit, Jenkintown Bank & Trust Company		$21,853.29
Petty Cash		40.00
Time Deposits:		
American National Building and Loan Association, Baltimore, Md.	$ 5,000.00	
Atlanta Federal Savings and Loan Association, Atlanta, Ga.	5,000.00	
Augusta Building and Loan Association, Baltimore, Md.	5,000.00	
Aurora Federal Savings and Loan Association, Baltimore, Md.	5,000.00	
Fidelity Federal Savings and Loan Association, Glendale, Calif.	5,000.00	
Home Building and Loan Association, Los Angeles, Calif.	5,000.00	
Occident Federal Savings and Loan Association, Baltimore, Md.	5,000.00	
Peoples Federal Savings and Loan Association, Detroit, Mich.	5,000.00	
Progress Federal Savings and Loan Association, Baltimore, Md.	5,000.00	
Standard Savings and Loan Association, Baltimore, Md.	5,000.00	
Standard Savings and Loan Association, Detroit, Mich.	5,000.00	
Suffolk County Federal Savings and Loan Association, Babylon, N. Y.	5,000.00	
Surety Savings and Loan Association, Detroit, Mich.	5,000.00	65,000.00

Accounts Receivable:			
Advertising, Subscriptions, Books and Reprints		$ 2,270.47	
Members at Large		751.02	
Branch Supplies		2.40	3,023.89
Deposit with Bell Telephone Company			200.00
Deposit with Copyright Office			32.00
Total Assets (Note A)			$90,149.18

LIABILITIES AND FUND

Current Liabilities:			
Payroll Taxes withheld from Employees		$ 704.88	
Advertising Advance Payments		32.99	
Foreign Advances		18.72	
Total Current Liabilities			$ 756.59
Unexpended Appropriations of Funds:			
Convention Account		$ 582.33	
Industrial Finishing Exposition Account		4,552.37	
Total Unexpended Appropriation			$ 5,134.70
General Fund:			
Balance April 1, 1950		$79,639.94	
Less, Appropppriations:			
Balance of Appropriation for Industrial Finishing Exposition	$ 5,000.00		
Balance of Convention Profits Appropriated to Convention Account	1,466.44		
Appropriation to General Society Account for New Educational Activities	3,600.00		
Appropriation to Publication Account for Promotion	2,000.00		
Total Appropriations from Fund		12,066.44	
		$67,573.50	
Add, Excess of Income over Expenditures for the fiscal year ended March 31, 1951, per statement attached			
General Society Account (loss)	$ 6,123.36		
Publication Account	22,807.75	16,684.39	
Balance, March 31, 1951			84,257.89
Total Liabilities and Fund			$90,149.18

NOTE A: Exclusive of inventories of publications, literature and supplies, office furniture and equipment, accounts payable and prepaid and accrued expenses.

General Fund

STATEMENT OF INCOME AND EXPENSES FOR THE FISCAL YEAR ENDED MARCH 31, 1951

SOCIETY ACCOUNT

INCOME			
Sales:			
"Proceedings"		$ 888.95	
Books and Reprints		3,101.22	
Glasstone Book		120.51	
Branch Supplies		54.55	$4,165.23

Branches in January just prior to their application for temporary charters. Past President A. W. Logozzo also spoke before these Branches in March, and all reports indicate great enthusiasm and potentially very active Branches in both places.

PUBLICATIONS

The print order for the April, 1951 issue of PLATING was 7,400 copies, of which 300 were for inventory. There has been a substantial increase in the subscribers to PLATING, the total now being approximately 1,095. In a sense, this serves as an independent testimony to the value of PLATING magazine.

Forty-nine copies of Dr. Samuel Glasstone's book, "Fundamentals of Electrochemistry and Electrodeposition", were sold during the year.

The *Proceedings* of the technical sessions of the 1950 Convention were published and mailed to members by January 1, 1951. This volume is sold to nonmembers at the established price of $5.00 per copy, and $8.00 is charged for sales abroad. A substantial inventory of back copies of the 1946-50 *Proceedings* is available for those who wish to purchase them. We should again mention the fact that members receive a copy of the annual *Proceedings* as part of their membership dues only if their names are on the Society's mailing list as members in good standing on August 31 of the fiscal year. A member joining the Society after August 31 of a given year must purchase a copy of the *Proceedings* for the year in question.

Before leaving the subject of the *Proceedings*, it should again be pointed out that the Society spends money every year on the technical *Proceedings*. Last year the cost per member was $1.75, whereas the profit from the sale of all *Proceedings* amounted to only $0.16 per member. Furthermore, elimination of the *Proceedings* as a separate bound volume in order to save money, as has been suggested, does not necessarily mean that the members must lose these valuable papers and discussion inasmuch as they could readily be published in PLATING.

EDITORIAL BOARD

The Editorial Board was created in 1948, as provided in the revised Constitution and By-Laws, in order to improve the supply of high-quality papers for the Society's publications and to correct difficulties experienced in the solicitation of papers under the former procedure, particularly with respect to Convention papers. Its members are certainly among the best informed authorities in the field and are chosen to give the Board a balanced scientific and practical viewpoint. The Board not only has the responsibility of providing papers, but also determines editorial policy and advises the Executive Board on educational matters, such as the

proposed handbook and correspondence course.

The job done by the Board has been outstanding. It has been made more difficult in recent months owing to the international situation and the great demands which are being made on all technical personnel. In spite of this, the three meetings which the Board held during the year have been very well attended, and the individual members have spent many hours of time soliciting papers through correspondence and personal effort. The members of the Board and the companies they represent are rendering a great service to this Society, which should be fully appreciated by all of our members.

Other Society Activities

A large number of requests were received for technical information and assistance, a number of which were written up for the Question Box department of Plating. During the past year the number of inquiries has increased, both from this country and abroad. Many of these questions have been referred to members of the Society best qualified to answer them. The members' cooperation in supplying these answers is greatly appreciated and adds to the practical value of the material in Plating.

At the March 17th meeting of the Executive Board it was finally agreed to proceed with plans for the Industrial Finishing Exposition to be held at the International Amphitheatre in Chicago from June 16–20, 1952. The I. F. E. Committee, under Chairman Clyde Kelly, is now energetically promoting the Exposition.

There has long been a need for a course on electroplating that would specifically meet the requirements of the practical man. The problem has been complicated by the fact that those desiring instruction in electroplating vary greatly in their educational background and experience. It has been further complicated by the fact that the organization and presentation of a suitable course at an institution is hardly justified unless the demand for the course is substantial. While there is a substantial demand, those desiring the instruction are scattered throughout the United States and, therefore, are unable to attend a course given at one location. Many desiring instruction are employed during the daytime so that a night course is necessary, or, at least, opportunity to receive instruction and to study is limited to free time. After devoting many hours to consideration of this matter, the Executive Board concluded that a correspondence course would meet the requirements. Steps are, therefore, being taken to make available an A. E. S. sponsored correspondence course. More will be reported upon this in the next few months.

Per Capita Tax levied (Pro Rata share)	14,399.71
Foreign Membership Dues levied (Pro Rata share)	718.13
Interest on Savings Fund Accounts	1,892.80
Miscellaneous Income	132.79
Appropriation from General Fund (Reserve) for New Educational Activities	3,600.00
Total Income	$24,908.66

EXPENSES

"Proceedings" Expense		$10,669.08
Books and Reprints Purchased		2,375.11
Glasstone Book Royalty		7.20
Branch Supplies Purchased		97.62
Salaries (Pro Rata share)		8,180.00
Travelling Expense:		
Executive Secretary	$ 860.76	
Officers	1,602.83	2,463.59
Officers' Office Expense		119.82
Furniture and Fixtures and Office Equipment		515.70
Secretary's Office Expense (Pro Rata share)		2,308.06
New Educational Activities		4,295.84
Total Expenses (Note B)		$31,032.02
Excess of Expenses over Income transferred to General Fund		$ 6,123.36

SUMMARY

	Society Account	*Publication Account*	*Total*
Total Income	24,908.66	$108,276.72	$133,185.38
Total Expenses	31,032.02	85,468.97	116,500.99
Excess transferred to General Fund	$ 6,123.36*	$ 22,807.75	$ 16,684.39

* Loss

Note B: The expenses reported do not take into account the changes during the period in inventories of publication, literature and supplies, office furniture and equipment, accounts payable and prepaid and accrued expenses.

General Fund

STATEMENT OF RECEIPTS AND DISBURSEMENTS OF APPROPRIATED FUND ACCOUNTS FOR THE FISCAL YEAR ENDED MARCH 31, 1951

CONVENTION ACCOUNT

April 1, 1950, Unexpended Balance of Convention Profits appropriated from General Fund	$1,466.44

RECEIPTS

Share of Profit Boston Convention	$ 444.99	
Miscellaneous Income, Boston Convention	133.81	
Refund of Society Expenses, Boston Convention	1,057.64	
Total Receipts		1,636.44
		$3,102.88

Cooperative Activities

The Society is extending its cooperation with a number of outside associations and agencies. We have continued close cooperation with the National Association of Metal Finishers on matters of mutual interest. We have continued representation on committees of the American Standards Association and of the American Society for Testing Materials. We have representation on the National Technical Task Committee, a group functioning under the U. S. Public Health Service. We have liaison with the Ohio River Valley Water Sanitation Commission through President Neill.

We are currently working closely with the International Fellowship Club in connection with its efforts to serve this Society. We have taken steps to further our cooperative activities with the Federation of Sewage Works Association. We are continuing through appointed representatives to participate in the Inter-Society Corrosion Committee activities. Dr. William Blum has been appointed the Society's delegate to the American Chemical Society's Diamond Jubilee Meeting in September.

The Metal Finishing Industry Action Committee, of which W. L. Pinner is Chairman, deserves special comment. This group is serving the O. R. V. W. S. Commission for the Metal Finishing Industries in supplying needed information on various phases of the metal-finishing-waste problem. The A. E. S. Research Committee is cooperating with this group by supplying information on suitable methods for testing the components of metal-finishing waste. The information emanating from this committee's activities will ultimately be made available through the Commission and will prove of great value to the industry in solving its waste-disposal problems.

The Society assisted the Metal Finishing Specialist Team of Great Britain which visited the United States under the sponsorship of the Economic Cooperation Administration by cooperating in the planning of the itinerary and by sponsoring a meeting of the group with certain industry representatives in the Philadelphia area. Branches and individual members of the Society also entertained the group and assisted it in arranging for plant visitations and the attainment of its objectives.

Acknowledgment

During the past year there were six personnel changes in the headquarters' staff. In spite of the training load involved and the required adjustments, the group performed most efficiently. Its cooperation is gratefully acknowledged.

A. Kenneth Graham

DISBURSEMENTS

Boston Convention Expenses:		
Convention Programs, Letters, etc.	$ 388.65	
Registration Forms	56.06	
Founders' Registration and Expense	122.00	
Miscellaneous Travelling Expenses	244.30	
Other Expenses	21.05	$ 832.06
Los Angeles Advances and Expenses:		
Advances to Los Angeles Branch	$1,000.00	
Letters and Expenses	83.49	1,083.49
Buffalo Advances and Expenses:		
Advances to Buffalo Branch	$ 500.00	
Expenses of Meeting with Buffalo Committee	105.00	605.00
Total Disbursements		2,520.55
March 31, 1951, Unexpended Balance of Funds Appropriated to Convention Account		$ 582.33

INDUSTRIAL FINISHING EXPOSITION ACCOUNT

April 1, 1950, Balance of Appropriation for Industrial Finishing Exposition Transferred from General Fund	$5,000.00
RECEIPTS	
None	
DISBURSEMENTS	
Miscellaneous Industrial Finishing Exposition Expenses	447.63
March 31, 1951, Unexpended Balance of Funds Appropriated to Industrial Finishing Exposition Account	$4,552.37

Research Fund

BALANCE SHEET, MARCH 31, 1951

ASSETS

Demand Deposit, Abington Bank and Trust Company		$ 6,033.90
United States Treasury 2% Bond due September 15, 1953 (Quoted Market Value $5,000.00)		5,000.00
Time Deposits:		
Atlantic Federal Savings and Loan Association, Baltimore, Md.	$5,000.00	
Baltimore Federal Savings and Loan Association, Baltimore, Md.	5,000.00	
First Federal Savings and Loan Association, Waterbury, Conn.	5,000.00	
First Federal Savings and Loan Association, Detroit, Mich.	5,000.00	
Liberty Federal Savings and Loan Association, Baltimore, Md.	5,000.00	
Loyola Federal Savings and Loan Association, Baltimore, Md.	5,000.00	30,000.00
Accounts Receivable, Research Reprints		385.41
Total Assets		$41,419.31

FUND

Research Fund:	
Balance, April 1, 1950	$50,732.58
Deduct, Excess of Expenses over Income for the year ended March 31, 1951, per attached statement	9,313.27
Balance, March 31, 1951	$41,419.31

Research Fund

STATEMENT OF INCOME AND EXPENSES FOR THE FISCAL YEAR ENDED MARCH 31, 1951

INCOME		
Sustaining Membership Dues and Subscriptions	$31,171.48	
Sale of Reprints	5,478.88	
Interest on Saving Fund Accounts	857.88	
Interest on U. S. Treasury Bond	150.00	
Miscellaneous	4.00	
Total Income		$37,662.24
EXPENSES		
Salaries of Project Directors and Associates	$28,952.78	
Project Payments to Institutions	8,725.00	
Cost of Reprints	4,161.00	
Supplies	1,210.91	
Legal Expenses	165.00	
Office Expense	23.90	
Per Capita Tax, Sustaining Members paid to General Fund	1,160.90	
Travel Expenses	249.63	
Miscellaneous Expense	2,326.39	
Total Expenses		46,975.51
Excess of Expenses over Income		$ 9,313.27

RESEARCH COMMITTEE CHAIRMAN'S REPORT

Wesley

In spite of a net reduction of one in the number of active projects, which was the first step taken this year by your Committee toward balancing expenditures and income, the information made available through research papers during the past year has been more valuable than ever. This is what is to be expected of a sound research program: because it takes one or two years of a fellowship to prepare a literature review, get into experimental work, achieve an experimental objective, prepare a technical paper, clear the paper through the Research Committee, and finally have it reach its place in the publication schedule of PLATING. You are assured a steady flow of immediately useful and also of fundamental research data from the remaining projects.

POLICY

As is usual, a large part of the time donated by the Research Committee members was devoted to deciding matters of policy. A new set of by-laws has been formulated and adopted by the Committee, which state the inflexible rules of procedure. Among the changes incorporated in the by-laws was the addition of one officer by the creation of two vice-chairmanships, now called Vice-Chairman, Research, and Vice-Chairman, Finance, respectively. In this way, greater recognition is given to the men saddled with the onerous tasks of soliciting contributions to the Research Fund and of managing the general research program.

A Special Policy Subcommittee has been appointed to draw up a handbook of procedure to help guide the Research Committee (and the whole research organization under it) in making the hundreds of lesser decisions which must be made every year in an active program. New precedents are being set from time to time, and, although they are all duly recorded in the minutes of Committee meetings, some may be lost insofar as being of use to later Research Committees is concerned. An example of an important precedent is a policy adopted in cooperation with the Executive Board in answer to requests from Canadian and Australian Branches, stating the conditions under which research fellowships may be set up in foreign countries.

STATUS OF PROJECTS

The Committee is operating eight active projects.

Project No. 2—The title of this project has now been changed to "Analytical Procedures for Determining Ingredients of Wastes from Plating Plants". Started in 1944, this project has produced a large amount of data, including more than twenty workable methods for analysis of plating solutions. There is no plating shop in the country which cannot profit by the published papers from this project. The new work on plating-plant wastes should be equally useful and will be done at a cost insignificant in comparison with the costs of lawsuits and fines it will help avoid. Funds are being solicited from a government water-sanitation commission which will permit doubling the effort expended in this work.

Project No. 5—"Effect of Impurities and Purification of Electroplating Solutions". The ability to recognize the effects of various impurities in plating solutions and to remove the harmful ones is the keystone to successful plating-plant operation with a minimum of rejected work. The experimental technique required to get reproducible results in this work has proven to be exacting, and the painstaking attention needed makes progress seem slow. A few of the data on the effects of zinc and iron in nickel plating solutions are at variance with preconceived ideas and must be determined again to demonstrate their reproducibility beyond reasonable doubt. The impurity now being studied is chromium in nickel plating solutions.

Project No. 6—"Nature and Effects of Porosity in Electrodeposits". The potential importance of fundamental work of this type was brought out by the writer in his talk before the Boston Convention last year. The expected benefits from Project No. 6 were stated at that time, and they all add up to pointing the way to improvement in the protective value of electrodeposited coatings. In the past year another step toward ultimate discovery of the true nature of pores has been taken. It has been definitely determined that the diameters of the channels in electrodeposited foils, which constitute "intrinsic porosity", are large enough to permit free passage of molecules of certain heavy gases but too small to be permeable to liquids. Experiments with still larger gas molecules are in progress, as well as work with other physical methods, which should eventually give a clearer estimate of the exact sizes and shapes of such pores.

Along an entirely different approach, studies of corrosion behavior of nickel-plated iron were made which led to the development of a quantitative way of measuring the damage done by corrosion. This way is more reproducible than the appearance ratings generally employed heretofore. It will be described in the next publications from Project No. 6.

Project No. 9—"Physical Properties of Electrodeposits". The amount of data on the properties of nickel is so large that

months have been required to describe them, rearrange them into readily usable tabular and chart forms, and prepare the final report on nickel. This report is now being typed and contains about 27,000 words in addition to 18 tables and about 70 figures. It is fortunate indeed that the American Electroplaters' Society and the National Bureau of Standards were foresighted enough to have had this work done, because much of the information is now needed in heavy-nickel plating and electroforming developments for the defense effort.

Project No. 10—"Disposal of Plating Room Wastes". All the experimental data needed for operating a process of complete removal of cyanides from waste effluents by oxidation with hypochlorites have been obtained and presented in the form of a technical paper. This paper, together with one of analytical methods for the determination of cyanides, was released to all Sustaining Members of the A. E. S. in advance of publication. The response was very gratifying and testified to the importance of the research being done in this project. The first-mentioned paper is to be published in PLATING in June, 1951.

Work on the possible disposal and recovery of cyanides by the ion exchange method was begun in February.

Project No. 11—"Current and Metal Distribution in Electroplating". The goal of this project is to prepare hundreds of graphs and charts showing the actual (not the theoretical) metal distributions obtained on cathodes of various types plated in commercially important plating baths. From these charts and tables, the practical plater should be able to figure out how to rack his work in order to improve metal distribution and reduce waste. Here, again, experimental technique has proven to be very critical, and misleading results have sometimes been obtained. This makes progress seem slow, but the information will be well worth the modest sums being expended to obtain it. A paper on distribution of copper deposits on a variety of cathode shapes is in the hands of the Project Directing Subcommittee at present.

Project No. 12—"Cleaning and Preparation of Metals for Electroplating". Most platers will agree that a research program would not be complete if such an important field as the cleaning of metals were to be disregarded. Even if this project were to do no more than establish a reliable quantitative test for degree of cleanliness of a metal surface, it would be worth a great deal. The first experimental job tackled by this project was to develop a standard cleaning and soiling technique so that duplicate specimens can be prepared whenever needed for cleaning tests. A paper describing this new procedure was published in the April 1951 issue of PLATING. The next phase

RESEARCH COMMITTEE, 1950-1951

Dr. W. A. Wesley, *Chairman*
The International Nickel Company, Inc.

G. M. Cole, *Vice-Chairman, Research*
Ternstedt Division, General Motors Corporation

H. J. Struckhoff, *Vice-Chairman, Finance*
Lasalco, Inc.

N. E. Promisel
Bureau of Aeronautics, Navy Dept.

W. L. Pinner
Houdaille-Hershey Corporation

J. J. Duffy, Jr.
Pennsylvania Salt Mfg. Company

G. W. Jernstedt
Westinghouse Electric Corporation

Dr. Donald Price
Oakite Products, Inc.

Clyde Kelly
B. Mercil & Sons Plating Company

EX-OFFICIO MEMBERS

W. J. Neill
A. E. S. President

Dr. A. K. Graham
A. E. S. Executive Secretary

HONORARY MEMBER

Dr. William Blum, National Bureau of Standards

LIAISON MEMBERS

C. H. Sample
Representing A.S.T.M. Comm. B-8
The International Nickel Co., Inc.

G. E. Best
Representing A.S.T.M. Comm. D-19
Mutual Chemical Co. of America

FINANCE SUBCOMMITTEE

H. J. Struckhoff, *Chairman*
Lasalco, Inc.

Clyde Kelly
Vice-Chairman, Western Section
B. Mercil & Sons Plating Company

Del Robson
Vice-Chairman, Eastern Section
Reynolds-Robson Supply Company

J. J. Duffy, Jr., *Publicity*
Pennsylvania Salt Manufacturing Company

RESEARCH DIRECTING SUBCOMMITTEE

G. M. Cole, *Chairman*
Ternstedt Division, General Motors Corporation

Dr. Donald Price, *Research Supervisor*
Oakite Products, Inc.

Dr. R. A. Schaefer, *Research Supervisor*
Cleveland Graphite Bronze Co.

G. W. Jernstedt, *Research Supervisor*
Westinghouse Electric Corporation

RESEARCH PROJECTS

Project No.	Location	Project Director	Project Directing Subcommittee	Year Accepted
2	Lehigh University	Prof. E. J. Serfass	Dr. D. G. Foulke, Chairman, Hanson-Van Winkle-Munning Company Dr. W. R. Meyer, Enthone, Inc., R. A. Ehrhardt, Bell Telephone Laboratories, Inc.	1944
5	Michigan State College	Prof. D. T. Ewing	Dr. J. E. Stareck, Chairman, United Chromium, Inc. Leslie Borchert, Houdaille-Hershey Corporation Joseph Gurski, Ford Motor Company	1945

Project No.	Location	Project Director	Project Directing Subcommittee	Year Accepted
6	Princeton University	Dr. N. Thon	Dr. L. Weisberg, Chairman, Consultant Dr. B. Egeberg, International Silver Company Clifford Struyk, General Chemical Division, Allied Chemical & Dye Corp.	1946
9	National Bureau of Standards	Dr. A. Brenner	Dr. W. Blum, National Bureau of Standards E. R. Bowerman, Sylvania Electric Products, Inc. N. E. Promisel, Bureau of Aeronautics, Navy Department	1947
10	Yale University	Prof. B. F. Dodge	H. B. Smith, Chairman, R. Wallace & Sons Manufacturing Company L. A. Danse, General Motors Corp. F. J. Holt, E. I. duPont de Nemours & Company	1947
11	Evansville College	Prof. J. Kronsbein	Dr. R. A. Schaefer, Chairman, Cleveland Graphite Bronze Company Dr. L. Westbrook, Consultant Rex Oyler, Guide Lamp Division, General Motors Corporation	1948
12	Columbia University	Prof. H. B. Linford	E. T. Candee, Chairman, Lea Manufacturing Company Dr. W. A. LaLande, Pennsylvania Salt Manufacturing Company Dr. Edward Parker, Technic, Inc.	1948
13	National Bureau of Standards	Fielding Ogburn	C. H. Sample, Chairman, The International Nickel Company, Inc. Dr. W. Blum, National Bureau of Standards A. Mendizza, Bell Telephone Laboratories, Inc.	1950

of the work involved the development of tests to determine the degree of soiling or cleanliness of a metal surface. In this work a new procedure called the "atomizer test" was invented. It seems to be much more useful than the older fluorescent-dye test, the copper test, or the ferricyanide test. The atomizer test is described in two papers, of which the first is in the hands of the editor of PLATING.

Project No. 13—"The Relation between Permeability and Protective Value of Electrodeposited Coatings". The objective of this project, which was activated in September, 1950, is to search for correlation between the intrinsic porosity of a deposit and its ability to protect the base metal from unsightly corrosion. It is hoped that, as a result of this work, a test will be developed for evaluating the quality of coatings which is superior to the salt-fog test in reproducibility and in significance.

NEW PROJECTS

In view of the new policy of the Research Committee of reducing expenditures as rapidly as possible without disrupting the research program, no new projects financed by the Research Fund are planned. A long-standing request from the Canadian Branches to establish a Canadian Project has been granted, however. This will be financed by the Canadian industry and the provincial government of Ontario, and will be carried out at the Ontario Research Foundation in Toronto. The A. E. S. Research Committee will administer the project in the usual way, and its reports will appear in PLATING. Only a token contribution toward the project will be made from the Research Fund.

The subject of the Canadian Research Project selected by a Canadian subcommittee from a list submitted by the Research Committee will be: "Methods of Removal of Impurities from Commercial Electroplating Electrolytes". Close liaison with Project No. 5 will be maintained to avoid any duplication of effort.

PUBLICATIONS

In the year from March, 1950, to March, 1951, inclusive, a total of 12 papers appeared in PLATING, including one from Project No. 12 which was so long that it was published in three installments. Six of the projects were represented in these reports.

A new policy has been adopted in connection with the release of particularly important or immediately useful research reports. Such information will be passed on to the Sustaining Members as soon as it can be properly written up and well ahead of normal publication dates. These advance releases are labeled "confidential" and are not to be copied or reprinted. Two reports from Projects Nos. 2 and 10 have been released to Sustaining Members under this policy, and the response has been very favorable. Those members of the A. E. S. Research organization who are responsible for soliciting sustaining memberships are particularly pleased with the new policy and say that it will prove helpful in selling such memberships.

RESEARCH SUBSCRIPTIONS

BRANCH CONTRIBUTIONS	
Baltimore-Washington	$155.00
Bridgeport	37.00
Chicago	345.00
Cleveland	190.00
Dayton	150.00
Detroit	420.00
Milwaukee	200.00
Pittsburgh	125.00
Providence-Attleboro	100.00
St. Joseph Valley	70.00
Waterbury	339.48
OTHER CONTRIBUTIONS	
D. W. Munro	25.00
A. K. Graham	15.00

FINANCES

The financial statement reflects an increase in sales of Sustaining Memberships and a decrease in the net deficit for the year's operations. As stated before, your Research Committee has planned a gradual retrenchment of its activities to reduce or eliminate the annual excess of expenses over income without loss of valuable data and experience by abrupt, arbitrary termination of research fellowships.

The Finance Subcommittee of the Research Committee has been reorganized in a way which promises to lead to continued increase in the annual receipts from Sustaining Memberships and contributions. Under the Vice-Chairman, Finance, there are now an Eastern and a Western Vice-Chairman of the Finance Subcommittee. The boundary between their territories is a line through the eastern boundary of the State of Ohio, except that the Southeastern Branch is one of the "Eastern" Branches. The two Vice-Chairmen are assisted by a number of District Supervisors, each of whom in turn keeps in touch with the Research Finance Committee Chairmen of a number of local Branches in a given area.

It is sincerely to be hoped that the moves under way at present to set aside a portion of every A. E. S. member's dues for the Research Fund will at long last be successful at the Buffalo Convention.

W. A. WESLEY

PUBLIC RELATIONS COMMITTEE CHAIRMAN'S REPORT

Phillips

Mr. S. E. Sangster continued to act as our writer for this activity. He was successful in getting a large number of releases into various magazines and newspapers.

In the two years in which this activity has been going on, over 28 magazines have carried some of our feature material. Among these I might mention two issues of Popular Science Monthly, Motor News, Quick, and Think. Among trade publications we might mention Steel, Iron Age and Automotive News as examples. There have also been a number of News Releases. One of the more important ones, put out within the last month, had to do with customer care of plated parts on automobiles.

The total circulation reached has been over 8 million. To have paid for this space at normal advertising rates would have cost considerably in excess of $100,000. The cost to A. E. S. in money has been somewhere in the neighborhood of $7,500. This, of course, does not include the efforts put forward by our members and by the office in Jenkintown, which have been very helpful indeed in many ways.

At the time of the Detroit Branch Annual Meeting, a movement was made to enlist the support of the International Fellowship Club. This move has resulted in I. F. C. taking over directly the financing of our Public Relations activity. It is also most fortunate that a number of I. F. C. members will be members of the new committee to be formed at the time of our Annual Meeting in Buffalo. The writer believes that this is the start of an activity which is most necessary to the continued growth of the plating industry.

W. M. Phillips

LAW COMMITTEE CHAIRMAN'S REPORT

Glover

The Law Committee during the year has reviewed the proposed revisions of By-Laws of the Cincinnati, Cleveland, and Lancaster Branches and has passed on and found perfectly healthy a few amendments brought up by the Branches and one for the Society. The year brings to twenty the number of Branch by-laws reviewed by the Committee. There have been no conspicuous faults in the drafts submitted, but your Chairman feels that some suggestions have been offered which may have simplified somewhat the work of Branch officers.

Earl Coffin, Los Angeles Branch, was appointed to the Committee on Nov. 20, 1950.

Manson Glover

SUSTAINING MEMBERSHIP LIST

As of June 10, 1951

(Figures in parenthesis indicate number of memberships held.)

Accurate Electro-Plating, Inc.
Accurate Engineering Laboratories
Acme Plating Company, The
Acme Steel Company
Adolph Plating, Inc.
Advance Plating Company, The
Aetna Electroplating Company
Allen-Bradley Company
Allied Industrial Products, Inc.
Alsop Engineering Corporation
Aluminum Company of America
American Buff Company
American Cabinet Hardware Corporation
American Can Company
American Chemical Paint Company
American Fixture & Manufacturing Company
American Flange & Manufacturing Company
American Hot Dip Galvanizer's Association, Inc.
American Instrument Company
American Nickeloid Company
American Radiator & Standard Sanitary Corporation
American Smelting & Refining Company
American Wire Fabrics Corporation
American Zinc Institute (5)
Apex Plating Company
Apollo Metal Works
Apothecaries Hall Company
Ardco, Incorporated
Armco Steel Corporation
Arrow-Hart & Hegeman Electric Company
Arrow Plating Company, Inc.
Arvin Industries, Inc.
Auto City Plating Company
Automotive Rubber Company
Bastian-Blessing Company, The
Belke Manufacturing Company
Bell Telephone Laboratories, Inc.
Bendix Products Division, Bendix Aviation Corporation
Berteau-Lowell Plating Works
Bethlehem Steel Company (2)
Blakeslee, G. S. & Company
Briggs Manufacturing Company
Brookline Electro Platers, Inc.
Bruce Products Corporation
Buckeye Products Company, The
Buckingham Products Company (2)
Canadian Hanson & Van Winkle Company, Limited
Chase Brass & Copper Company
Chemical Corporation, The
Chicago Electro-Platers Institute
Chicago Thrift-Etching Corporation
Chrome-Rite Company (2)
Chromium Corporation of America
Chromium Process Company, The
Chrysler Corporation (2)
Cinch Manufacturing Corporation
Clayton Mark & Company
Cleveland Graphite Bronze Company, The
Clinton Company, The
Clinton Supply Company, Inc.
Codman, F. L. & J. C., Company
Corona Corporation
Cowles Chemical Company
Crane Company
Croname, Incorporated
Crown City Plating Company
Crown Cork & Seal Company
Crown Rheostat & Supply Company
Darco Dept., Atlas Powder Company
Davies Supply & Manufacturing Company
Daystrom Corporation
Detroit Plating Industries
Diamond Alkali Company
Diversey Corporation, The
Dixie Electro Plating Company
Doehler-Jarvis Corporation (2)
R. R. Donnelley & Sons Company
E. I. duPont de Nemours & Company

Dura Div., Detroit Harvester Company
Dura-Chrome of Chicago, Inc.
Eastman Kodak Company (2)
Eaton Manufacturing Company
Ekco Products Company
Electric Auto-Lite Company, The (2)
Electro Coatings, Inc.
Electrolux Corporation
Ellmore Silver Company, The
Enthone, Inc.
Erie Plating Company
Felt & Tarrant Manufacturing Company
Finishing Publications, Inc.
Ford Motor Company (5)
Formax Manufacturing Company
Fox Products Company
Frigidaire Division, General Motors Corporation
Gemex Company
General Electric Company
General Motors Corporation (5)
Gerity-Michigan Corporation
Gorham Manufacturing Company
Graham, Crowley & Associates, Inc.
Graham Plating Works
Grand Plating Company
Great Lakes Industries, Inc.
W. Green Electric Company, Inc.
Frederick Gumm Chemical Company
C. Hager & Sons Hinge Manufacturing Company
Hall-Mack Company
Hamilton Watch Company
Hammond Machinery Builders, Inc.
Hanson-Van Winkle-Munning Co. (3)
Harding Manufacturing Company
Hardwood Line Manufacturing Company
Harshaw Chemical Company, The (3)
Haviland Products Company
Heil Process Equipment Corporation
Heywood-Wakefield Company
Houdaille-Hershey Corporation (3)
Howard Plating Industries, Inc.
Howell Company, The
Hub Plating Works
Hudson Motor Car Company
R. O. Hull & Company, Inc.
Hy-Grade Electroplating Company
Illinois Watch Case Company
Industrial Filter & Pump Manufacturing Company
International Business Machines Corporation
International Nickel Co., Inc., The (5)
International Silver Company
Jones & Laughlin Steel Corporation
Keeler Brass Company
Kelite Products, Inc.
Kelly Plating Company, The
Knape & Vogt Manufacturing Company
Knight-Morley Corporation
Knight Plating Company
Kocour Company
Kohler Company
Kuehne Manufacturing Company
Lasalco, Inc.
Lea Manufacturing Company, The
Leeds & Northrup Company
Chas. F. L'Hommedieu & Sons Company
A. J. Lynch & Company
Lyon, Incorporated
Maas & Waldstein Company
W. D. MacDermid Chemical Company
MacDermid, Incorporated
Magnuson Products Corporation
R. C. Mahoney
P. R. Mallory & Company
Manderscheid Company, The
Matchless Metal Polish Company, The
Mattatuck Manufacturing Company
Maurer Supply Company
McGean Chemical Company, The
Meaker Company, The
Mechanical Plating Company
Mercil Plating Equipment Company
B. Mercil & Sons Plating Company
Metal Mouldings Corporation
Metal Processing Company
Michigan Bumper Corporation
Michigan Chrome & Chemical Company
J. C. Miller Company
Mitchell-Bradford Chemical Co., The
Modern Plating Company
Modern Plating Company, The
Modern Plating Corporation
Monsanto Chemical Company
Moore Drop Forging Company
Motor Products Corporation
Mutual Chemical Company of America
George L. Nankervis Company
National Aniline Division, Allied Chemical & Dye Corporation
National Brass Company
National Cash Register Company, The
National Lock Company
National Plating Company, Inc., The
National Screw and Manufacturing Company, The
Nelson Chemicals Corporation
New England Buff Company
New England Plating Company
New Jersey Zinc Company (3)
George E. Nichols Plating
G. J. Nicholas & Company
Northwest Chemical Company
Northwestern Plating Works
Nutmeg Chrome Corporation
Oakite Products, Inc. (2)
Oneida, Ltd.

Protect them with M & W Clear Coatings that stand 800 HOURS OF SALT SPRAY!

Zinc die castings and zinc plated steel are being used more and more as big manufacturers swing to these parts to replace unavailable materials. BUT the copper, nickel and chromium normally used for plating are in tight supply *too.*

Here's an effective way to meet this new problem. *Coat the die castings and zinc plated steel parts—instead of plating them!* Coat them with the M & W finishes that stand up under salt spray and weatherometer tests for the extraordinary period of 800 hours . . . that protect the zinc against discoloration!

Use DULAC Clear Universal Lacquer #462 if you want an air-drying lacquer—CODUR Clear Synthetic Y743 for baking. They both give the same exceptional performance. Write for free Technical Data Bulletin #110, or let our M & W technical consultants discuss your requirements with you.

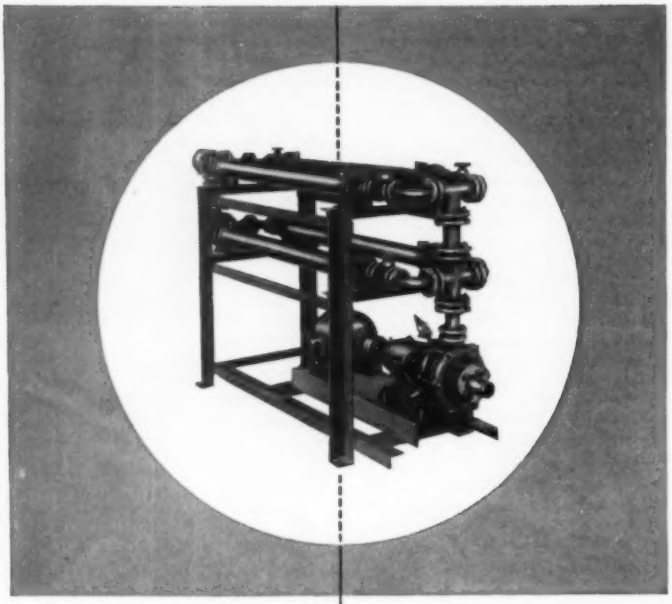
PIONEERS IN PROTECTION

PIONEERS IN PROTECTION 75th ANNIVERSARY M & W CO. 1876

MAAS & WALDSTEIN CO. 438 RIVERSIDE AVE., NEWARK 4, N. J.

MID-WEST DIV.—1660 CARROLL AVE., CHICAGO 12, ILLINOIS
PACIFIC COAST DIV.—SMITH-DAVIS CO., 10751 VENICE BLVD., LOS ANGELES 34, CAL.

MANUFACTURERS OF INDUSTRIAL FINISHES



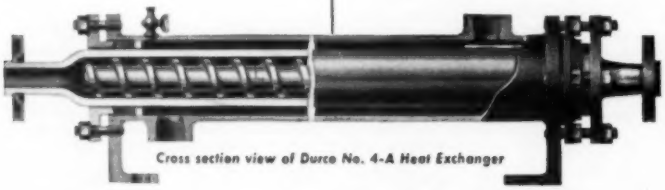
A highly corrosion resistant heat exchanger in a

READILY AVAILABLE ALLOY*

The **DURCO** No. 4-A Heat Exchanger efficiently heats or cools corrosive plating solutions.

In this exchanger, the corrosive is in contact only with Duriron parts. The units can be installed either horizontally or vertically, with counter or parallel flow, and permit flexibility of grouping for difficult locations.

***DURIRON** is a high silicon iron, resistant to most commercial acids and other corrosives such as nickel plating, copper plating, chrome plating and anodizing solutions.



Cross section view of Durco No. 4-A Heat Exchanger

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

We will send, on request, Bulletin 1610B giving complete details and specifications.

THE DURIRON COMPANY, Inc.
Box 1019, Dayton, Ohio

FOR FURTHER INFORMATION, USE READER SERVICE CARD: INDICATE A 623.

Packard Motor Car Company
Parker Rust Proof Company
Pennsylvania Salt Manufacturing Company, The
Perma-Line Rubber Products Corporation
Pheoll Manufacturing Company
Philco Corporation
Platers Supply Company
Plating Service Company
Precision Castings Company
Price-Pfister Brass Manufacturing Company
Products Finishing
Promat Division, Poor & Company
R. C. A. Victor Division, Radio Corporation of America
Reilly Plating Company
R. W. Renton & Company
Reynolds-Robson Supply Company (2)
Roberts Rouge Company
G. S. Robins & Company
Roto-Finish Company
Royal Plating & Polishing Company
Sargent & Company
Scientific Control Laboratories
Scovill Manufacturing Company
J. P. Seaburg Corporation
E. E. Seeley Company, Inc.
J. J. Siefen Company
Spaukler Manufacturing Company
Standard Plating Rack Company
Standard Plating Works
Standard Steel Spring Company (3)
Stanley Works, The
Studebaker Corporation, The
George A. Stutz Manufacturing Company
Sunbeam Corporation
Superior Steel Corporation
Sylvania Electric Products, Inc.
Talon, Inc.
Thomas Buff & Brush Company, Ltd.
Thomas Steel Company, The
Trico Products Corporation
Turco Products Corporation
Udylite Corporation, The (3)
United-Carr Fastener Corporation
United Chromium, Inc. (2)
United Manufacturing Company
United Platers, Inc.
United States Spring & Bumper Company
Van Der Horst Corporation of America
A. T. Wagner Company
Wagner Brothers, Incorporated
Wald Manufacturing Company
Walton & Lonsbury
Warner Electric Company
Waterbury Plating Company
Weirton Steel Company
Western Electric Company
Western Rustproof Company
Westinghouse Electric Corporation
Wheeler Industries, Inc.
Whitfield Chemicals
S. K. Williams Company
Winchester Repeating Arms Company
Winters & Crampton Corporation
Wollensak Optical Company
Worcester Brass Electro Plating Company
Wyandotte Chemicals Corporation
Yale Polishers & Platers, Inc.
Yankee Metal Products Corporation

PLATING OR POLISHING PROBLEMS?

Our service "shines" all over the great Southwest

Southwestern Sales and Service Representatives for these Famous Firms:

THE UDYLITE CORPORATION
JOSEPH R. DAVIES & ASSOC. ("Joe-D" Sisal Buffs)
R. O. HULL & COMPANY
INDUSTRIAL ELECTROPLATING COMPANY (Niehaus Fume Separators)
MacDERMID, INC.
OPTIMUS EQUIPMENT COMPANY
FREDERIC B. STEVENS, INC. (Subsidiary of Udylite Corporation)
ALROSE CHEMICAL COMPANY (Jetal Process)
ALLIED RESEARCH PRODUCTS (Iridite)
ALMCO DIVISION, QUEEN STOVE WORKS

ACME MANUFACTURING CO.
ALSOP ENGINEERING CO.
AUTOMOTIVE RUBBER CO.
BELKE MANUFACTURING CO.
COMMERCIAL FILTERS CORP.
DIVINE BROS. COMPANY
ELECTRIC PRODUCTS CO.
FORMAX MANUFACTURING COMPANY
GENERAL ABRASIVES CO.
HAMMOND MACHINERY BUILDERS
HLG ELECTRIC VENTILATING COMPANY
INDUSTRIAL FILTER AND PUMP MANUFACTURING CO.
KOCOUR COMPANY
KOLD-HOLD MANUFACTURING COMPANY
MANDERSCHEID COMPANY
MICHIGAN CHROME & CHEMICAL COMPANY
MIDWEST ABRASIVES
MINNESOTA MINING & MANUFACTURING CO.
MUTUAL CHEMICAL CO.
NATIONAL CARBON DIVISION OF UNION CARBIDE
NEW ENGLAND LEAD BURNING COMPANY
NEW HOLLAND MACHINE COMPANY
PENINSULAR CHEMICAL CO.
STORTS WELDING CO.

depend on
DAVIES

the Southwest's leading supplier of industrial plating and polishing

- EQUIPMENT
- MATERIALS
- KNOW-HOW

Davies

Supply & Manufacturing Co.

2315 Delmar Blvd. • MAin 3335 • St. Louis 3
301 N. Market St. • PRospect 5423 • DALLAS 1

THE **BIAS** BUFF

comprises a blending of finest material with expert craftsmanship, produced under the most favorable working conditions.

The BIAS Buff has the solid backing of the most substantial all-around supply source conceivable.

This is a factor appreciated by our customers and of great importance to them.

BIAS Buffs have been made in our Jersey City plant continuously for 30 years.

The BIAS Buff & Wheel Company
Division of RIEGEL TEXTILE Corp.
3464-66 Hudson Blvd.
Jersey City 7, N. J.

USE READER SERVICE CARD; INDICATE A 625.

SPEED-UP
your nickel stripping bath by adding
STRIPODE

Cuts acid consumption . . . protects base metal . . . reduces pitting and roughening . . . minimizes need for buffing and coloring.

WRITE FOR FULL INFORMATION

The CHEMICAL CORPORATION
54 Waltham Ave.
Springfield, Mass.

USE READER SERVICE CARD; INDICATE A 626.

Dear Sam: 7-1-51

So you think you're in good with the wife since you got that $400 raise because of Kushner's Plating Course? As one grad to another I can tell you my Boss got his annual report on plating operations from his accountant yesterday and he had the biggest smile ever when he told me to take two weeks on Company time for the Buffalo Convention. Now all Mary talks about is a second honeymoon. Wow!

Bill

USE READER SERVICE CARD; INDICATE A 627.

Article Abstracts

For copies of original articles, turn to your Public Library for photostats or addresses of the publications in question

Some Investigations on Black Oxide Finishes. H. Silman and B. E. Love. J. Electrodepositors' Tech. Soc. **25**, 65–75 (1950).
Describes black oxide coatings produced from a solution of NaOH, $NaNO_3$, and $Na_2Cr_2O_7$. Methods of measuring film thickness are described. Discusses protective value on nickel-chromium and plain carbon steels. Coating consisted of Fe_3O_4.

Electroplating of Beryllium. M. Kolodney. U.S. Atomic Energy Commission, AECD-2845, Aug. 1950, 3 pages.
Describes surface preparation. Summarizes plating solutions and operating conditions for silver, gold, cadmium, indium and tin plating.

Corrosion of Relief Valves in Sour-Crude Service. R. J. Hafsten. Proc. Am. Petroleum Institute **30 M** (III), 81–87 (1950).
Corrosion of 17–20 per cent chromium-steel disc guides was prevented by electroplating with 0.002–0.003 inch of chromium.

Electrochemical Method for Determination of Adhesion of Electrodeposits. A. T. Vagramyan and Yu S. Tsareva. Doklady Akademii Nauk USSR (new ser.) **74**, 303–305 (September 11, 1950).
Describes a method based on determination of the value of cathodic polarization during the electrodeposition process, and establishment of a relationship between the minimum value of polarization for the case of an absolutely pure electrolyte and a very clean cathode surface and the adhesion of the deposit. Comparison of data from the bending test with the new test shows close agreement.

Tin-Zinc Alloy Can Replace Cadmium. Anon. Steel **127**, 118, 120 (November 20, 1950).
A whole range of tin-zinc alloys can be electrodeposited, but according to Metal & Thermit Corporation, New York City, the most desirable one appears to be 80 per cent tin, 20 per cent zinc, with a tolerance of about 2.5 per cent either way. Outlines the plating process and properties of the deposit.

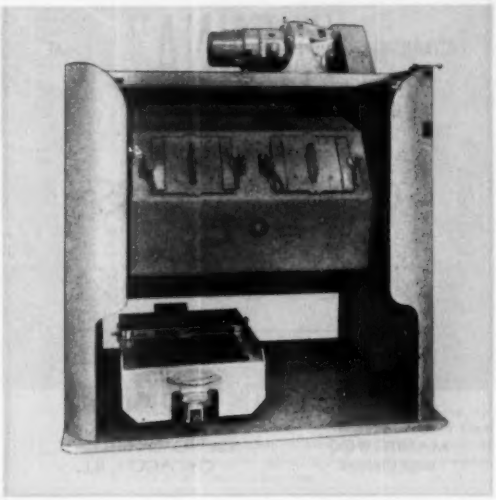
Destruction of Cyanide in Waste Waters by Chlorination. G. E. Eden, B. L. Hampson and A. B. Wheatland. J. Soc. Chem. Ind. **69**, 244–249 (August, 1950).
Presents results of a study of the reactions of sodium and calcium hypochlorites with buffered alkaline solutions of potassium cyanide. A process was developed for treating electroplating wastes or other waste waters containing cyanide by reaction with calcium hypo-

CROWN TUMBLING EQUIPMENT

for deburring... ball burnishing... finishing

Lower your manufacturing costs by volume handling of the deburring, ball burnishing or finishing operations... get greater product uniformity and fewer rejects.

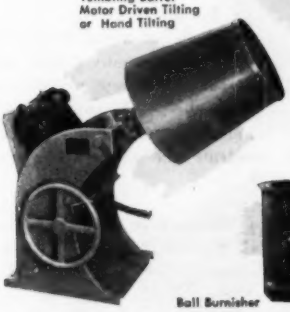
Remember—whether your product is die cast—steel—brass—or an alloy, there's a Crown tumbling machine to fit your requirements.



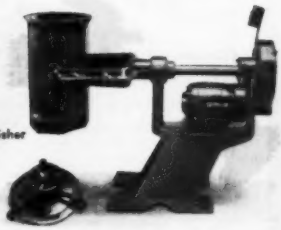
Horizontal Type
Tumbling Machine
Single Speed — Variable Speed

Bench Type Tilting
Tumbling Barrel

Jr. Tilting Type
Tumbling Barrel



Tilting Type
Tumbling Barrel
Motor Driven Tilting
or Hand Tilting



Ball Burnisher

barrels furnished

- Rubber Lined
- Wood Lined
- "Buffer Strip" Lined
- Unlined

SPECIAL TUMBLING MACHINES DESIGNED AND BUILT

WRITE FOR OUR COMPLETE CATALOG OF TUMBLING MACHINES AND ACCESSORY EQUIPMENT

CROWN RHEOSTAT AND SUPPLY COMPANY

3465 N. KIMBALL AVENUE • CHICAGO 18, ILLINOIS

"Rockwell" *Greetings*
TO DELEGATES AT THE
38th Annual Convention

•

DOMESTIC "VIENNA" LIME
(DOLOMITIC)

ABRASIVE FOR USE IN

COMPOSITIONS
And
STEEL POLISHING

Inquiries—Domestic and Foreign—Solicited

ROCKWELL LIME COMPANY

QUARRIES
MANITOWOC
WISCONSIN

OFFICES
228 NO. LA SALLE ST.
CHICAGO 1, ILL.

USE READER SERVICE CARD: INDICATE A 629.

PARAMOUNT BRAND

FELT WHEELS

Are you finishing articles which require a wheel with a "shaped" or contoured face? Don't forget that felt wheels lend themselves to contouring probably better than any other type of wheel. Don't forget, too, you have nine degrees of hardness to choose from when you buy Bacon Felt Wheels—The Paramount Brand. Ask your supply house for Paramount Brand Felt Polish Wheels.

SEND FOR OUR NEW CATALOG

...TOPS IN "Contourability"

Your Supply House Can Furnish Bacon PARAMOUNT BRAND FELT WHEELS & BOBS

BACON FELT COMPANY

Established 1824

WINCHESTER MASSACHUSETTS

"America's Oldest Felt Manufacturer" Felt Does It Better

748 USE READER SERVICE CARD: INDICATE A 630.

Article Abstracts

chlorite at *p*H 11. The process is applicable to liquids containing simple cyanides and the cpmplex cyanides of zinc, cadmium and copper but not to solutions containing nickel. 14 ref.

Electrolytic Polishing of Nickel. Glen W. Wensch. Metal Progress **58,** 735–736 (November, 1950). Describes modified bath composition and procedure.

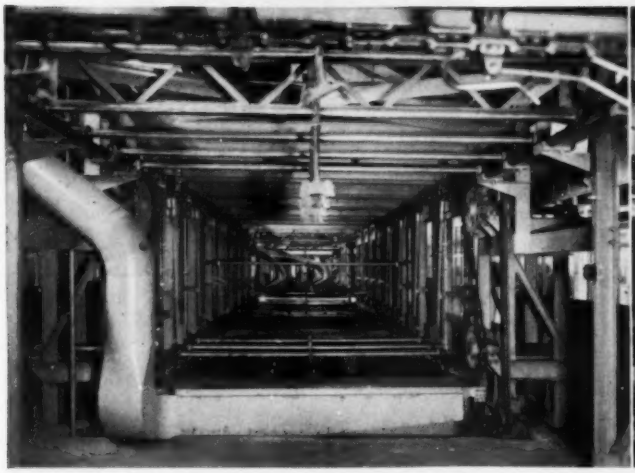
The Anodic Treatment of Aluminum and Its Alloys for Use in the Mouth. G. Grenville T. Tregarthen. Brit. Dental J. **86,** 227–228 (1949). Met. Abs. **18,** 525 (April, 1951).
The technique of anodizing aluminum dentures and other oral appliances is described in detail. The parts to be anodized must be flawless, highly polished, and chemically clean. The film is then formed equally over the surface no matter what deep cavities or crevices are present. Particulars are given for the sulfuric acid, oxalic acid, and chromic acid process. The pores of the film have to be sealed as a further protection against corrosion. Sealing is carried out with hot water, 2 per cent boiling potassium dichromate solution, or lanoline-benzene solution. Mechanical polishing is not permissible after anodizing.

'Alubril': The New Process for the Chemical Brightening of Aluminum Developed by the Instituto Sperimentali Dei Metalli Leggeri. Alluminio **19,** No. 15, 437–449 (1950); Light Metals Bull. **13,** 58–59 (January 19, 1951).
The brightening bath which has been developed is based on phosphoric acid with unspecified additions to control its action. The bath is used at a temperature of about 110° C (230° F), and a graph is given showing the weight and thickness of metal dissolved against time of immersion, which normally ranges up to 60 seconds. The treatment of different aluminum and aluminum-alloy products and applications of the process are discussed. A number of photographs of the before-and-after kind illustrate the excellent results obtained.

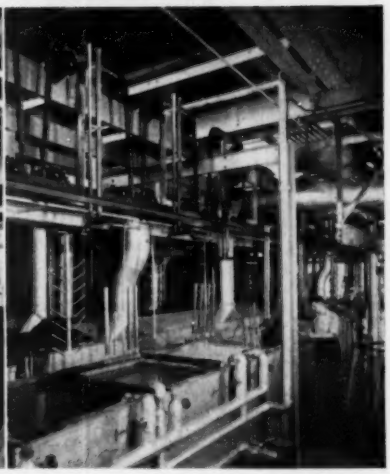
Chemical Polishing of Aluminum and Its Alloys. J. Herenguel and R. Segond. Societe Francaise de Metallurgie Resumes des Communications-Journees Metallurgiques d'Automne 15–16 (October 16–21, 1950).
A mixture of sulfuric and phosphoric acids with an oxidant, similar to that used in electrolytic polishing, can be used to polish light metals without the use of applied electric current. Formulae of this kind have been studied since 1926, but their use was not successful. From numerous studies made during the last few years successful formulae have been found. Commercial possibilities of the chemical polishing process are indicated, and reference is made to one or two applications of the process in connection with micrography.

in your plating How to Get

Greater Production
Improved Quality
Better Working Conditions

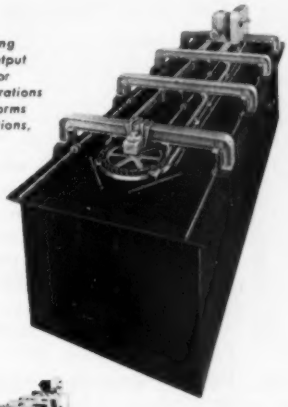


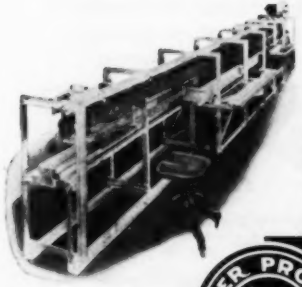
Typical Meaker Straight-A-Way Automatic Plating Machine. This type unit is designed to handle 125 racks or more per hour.



Meaker Return-Type Automatic Plating Machine for chromium-plating the large variety of parts in a high-quality line of plumbing hardware. Machine may be designed to copper plate, nickel plate and chromium plate in one continuous line.

A Meaker Semi-Automatic Plating Machine for use in medium-output plating departments and also for supplementing the plating operations in a Full Automatic which performs the cleaning, preplating operations, final rinsing and drying.





A special machine designed by Meaker for cleaning and silver plating small, brass contact clips.

You Get All Three with Meaker

Here's how! A Meaker plating machine makes every operation in the plating sequence automatic, or as mechanized as possible. This cuts to a minimum the manual handling of the parts in process—increasing production. The control of the quality of the plating is set and practically independent of the varying human element. A Meaker plating machine does clean up the plating room making for safer and more agreeable working conditions. And a bonus—in many cases the savings in the over-all plating costs have paid for the equipment in a short time.

Look to the handling methods in your plating department. You might be surprised what modern methods will accomplish. Whatever your requirements—full automatic, semi-automatic, or a special machine—Meaker has the answer.

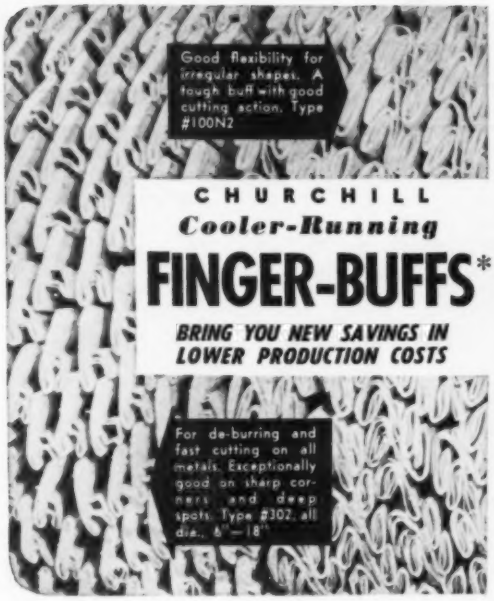
MEAKER PRODUCTS

Serving the Plating Industry for Over 50 Years

THE MEAKER COMPANY

1639 South 55th Avenue, Chicago 50, Ill. • Telephone Bishop 2-1920

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 632.


Good flexibility for irregular shapes. A tough buff with good cutting action. Type #100N2
CHURCHILL
Cooler-Running
FINGER-BUFFS*
BRING YOU NEW SAVINGS IN LOWER PRODUCTION COSTS
For de-burring and fast cutting on all metals. Exceptionally good on sharp corners and deep spots. Type #302, all dia., 6"—18"

FINGER-BUFFS* Reduce Production Costs

Churchill Finger-Buffs* with high-count, bias-cut cotton cloth and "self-air-cooled" buff fingers, provide longer buff life and greater production capacity.

You will make new savings with Churchill Finger-Buffs* because of their extra-fast cutting-down action. And a real economy when used to remove burrs and rough spots! The tougher your job, the better you'll like your Churchill Finger-Buffs*.

FINGER-BUFFS* for every Surface Finish

Construction of the Churchill Finger-Buff* can be regulated to produce the type of finish required on any metal surface. Write us your finish problem.

FINGER-BUFFS* for every Buffing Need

There is a Churchill Finger-Buff* for every buffing, polishing and de-burring need. Churchill Finger-Buffs* give you superior performance at lower cost.

Now is the time to make new savings, many ways, with Churchill Finger-Buffs*.

*Trademark reg.

Geo. R. Churchill Co., INC.

North Quincy 71, Mass.

REPRESENTATIVES IN PRINCIPAL CITIES

FREE Catalog

Geo. R. Churchill Co., Inc., North Quincy 71, Mass., Dept. P
Please send me FREE catalog and complete information.

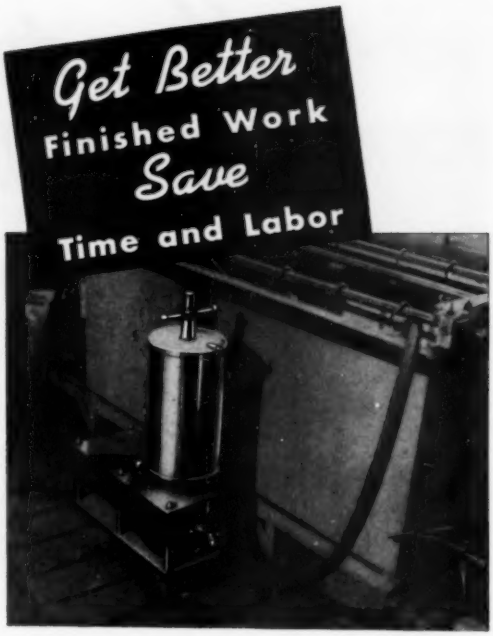
• My special buffing problem is.....

Name..... Title.....

Firm .....

Street .....

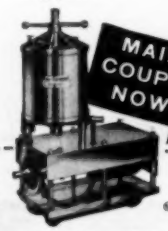
City..... Zone..... State.....



With a "Sealed-Disc" Filter

You'll get better finished plated work, save time and labor and you'll get longer service life from your plating solutions.

More and more cost-minded platers depend on Alsop "Sealed-Disc" Filters, to remove all dirt, dust and oil-sludge from their solutions and keep their solutions free from even the invisible impurities that cause trouble. Users of "Sealed-Disc" Filters save time and labor, they know that their clean work is being put into bright, clean solutions. Regardless of the size or type of your installation, there's a "Sealed-Disc" Filter to "fit your job"—write for complete information or contact your regular plating supplier.



MAIL COUPON NOW

Representatives in all principal cities in the United States and Canada as well as Argentina, Australia, Belgium, Brazil, Colombia, Denmark, England Holland, Mexico, Norway, Sweden, and South Africa.

ALSOP ENGINEERING CORP.
607 Fine Street Milldale, Conn.

Please send me FREE, your new book Alsop "Sealed-Disc" Filters.

Name.....

Firm Name.....

Address.....

City..... State.....

ALMCO

Supersheen

MODEL D-B 200

The Last Word in ADVANCED BARREL FINISHING

Model DB-200 shown with hoisting unit HU-1 and Hoist Pan Model HP-1.

THIS ADVANCED DESIGN BARREL OFFERS THE UTMOST IN *EASE, ECONOMY* AND *PRECISION* IN DEBURRING AND FINISHING OPERATIONS

- **EXTREMELY VERSATILE.** Handles micro-finishing of small precision parts with same ease as fast cutting down of larger castings, forgings, etc.
- **WIDE RANGE OF SPEEDS.** Speed drive adjustable from 6 to 30 RPM (Standard Equipment).
- **GREATER EASE OF OPERATION** — assured with positive magnetic brake that permits inching to position.
- **NEW — CAM-OPERATED DOORS.** Cut opening and closing time in half. No other door can match it for ease and simplicity of operation.
- **SAFETY FIRST.** Roll-a-way perforated hood permits positioning of barrel with hood down. No protruding parts.
- **ALL-WELDED STEEL CONSTRUCTION.**
- **AVAILABLE WITH OR WITHOUT NEOPRENE LINING.**

ALMCO Supersheen

AMERICA'S LARGEST MANUFACTURER OF ADVANCED BARREL FINISHING EQUIPMENT—MATERIALS AND COMPOUNDS
ALBERT LEA, MINNESOTA

ALMCO SUPERSHEEN PROVED LOWEST COST METHOD OF DEBURRING AND FINISHING METAL PARTS

There is no lower-cost method of deburring and finishing metal parts. A single Almco Supersheen unit installation replaces from 2 to 12 men — with actual savings running as high as 95%. We know of no installation that HAS NOT paid for itself in less than a year. Many installations pay for themselves in only ONE OR TWO MONTHS. In 10 typical Supersheen operations finishing costs averaged 80.1% less than former methods — from 48% on a threaded cast iron pipe "T" to 95% savings on a small trigger with intricate configurations.

NEW USES IN ALL FIELDS

Almco Supersheen Engineers have developed new techniques that have greatly widened the scope of barrel finishing. Now, manufacturers in all fields are using the Almco Supersheen process to cover a wide range of finishing operations — deburring, grinding, cutting down, cleaning, forming uniform micro-exact radii, improving surface finish, reducing surface porosity, finishing threaded and intricate parts, removing paint, coloring, burnishing, etc.

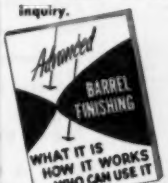
Whatever the operation — the Supersheen process affords the quickest, best, lowest cost method to "A Better Finish Faster".

CONTROL PLUS VERSATILITY

Advanced barrel finishing is controllable to the highest degree. Results are consistently uniform and satisfactory. All operating conditions can be controlled, making it possible to produce almost any desired micro-inch reading — and to remove metal in nearly any quantity desired.

FREE SAMPLE PROCESSING

Almco maintains complete sample processing and research facilities. Sample processing is done FREE! We invite your samples and inquiry.



FREE!
This new booklet will open your eyes to ADVANCED Barrel Finishing! Write for BOOKLET C-7

MAIL COUPON NOW!

ALMCO Supersheen, Albert Lea, Minn.

☐ Also send latest catalog.

NAME _____

ADDRESS _____

CITY _____ STATE _____

SAFETY EQUIPMENT FOR ALL INDUSTRIES

IPCO

NITROFLEX APRONS AND SLEEVES

PROTECTION AGAINST

Made of a new multi-purpose, clear, frosted plastic of proven superiority for protection against most acids, caustics, oils and solvents. Non-flammable. Light, flexible, comfortable. All seams electronically sealed.

WRITE FOR BULLETIN T-71

IPCO

Safety Equipment for all Industries

INDUSTRIAL PRODUCTS COMPANY

2824 N. FOURTH STREET • PHILADELPHIA 33, PA.

USE READER SERVICE CARD; INDICATE A 636.

Safe hands cut costs 5 ways

2 of many types, functionally designed for working hands:

Multi-ply coating of NEOX—reinforced neoprene, extremely resistant to cutting, abrasion and chemicals. Fabric lining prevents snags, absorbs sweat, insulates, makes gloves easy on and off. Firm non-slip grip.

Natural rubber treaded palm and thumb. Has firm grip, wet or dry; wears like a tire.

We have the case records of hundreds of on-the-job tests, handling sharp, abrasive and slippery materials, with and without the presence of heat, oils, greases, acids, caustics, solvents and degreasants—where proper selection of work gloves has resulted in:

1: Fewer lost-time accidents
2: Faster, surer work handling
3: Less spoilage
4: Improved job attitude
5: And 40% to 70% savings in usual glove costs.

There's a correct glove for every job. Smart management makes it available.

Edmont

Edmont Manufacturing Company
1250 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves

USE READER SERVICE CARD; INDICATE A 637.

Patent Abstracts

GEORGE B. HOGABOOM

Consultant, New Britain, Conn.

Copies of patents may be obtained by writing to Commissioner of Patents, Washington 25, D.C. Price 25 cents each.

No. 2,536,734, January 2, 1951—Cataphoretic Deposition of Boron—Oliver Flint, London, England.

The object of the invention is to provide a simple effective method of applying coatings of boron to electrically conducting surfaces, whereby the thickness of the coating may be controlled.

EXAMPLE. A 10 per cent suspension of amorphous boron in methyl alcohol, in which has been dissolved 1 per cent tannic acid and 5 per cent collodion (dissolved in acetone), is prepared by adding the required amount of boron to the methyl alcohol solution while stirring the mixture to disperse the boron. The copper cylinder, after undergoing degreasing and cleaning treatment, is immersed in the suspension maintained at substantially 38° C together with a copper or steel electrode to serve as a cathode. A potential of 60 volts is applied across the cylinder and cathode for 10 minutes, and the cylinder is withdrawn, dried and heated. A finished coating so deposited was adherent.

CLAIM 7. A method of depositing boron cataphoretically upon an electrically conducting surface which comprises applying a unidirectional electric potential across an anode consisting of said surface and a cathode through a suspension of finely divided boron in a substantially anhydrous medium comprising collodion and tannic acid, and an organic solvent therefor at substantially 38° C, the boron constituting from 2 to 20 per cent, the collodion 0.5 to 10 per cent and the tannic acid substantially 1 per cent of the suspension.

20 claims.

References cited: U. S. Patents 1,639,698; 2,321,439; 2,456,370; 2,462,125. Keyes et al., Chem. Abs. *24*, 2954 (1930). Laubengayer et al., J. Am. Chem. Soc. *65*, 1924–1931 (1943).

No. 2,538,055, January 16, 1951—Electrolytic Process for Removing Oxide from the Surface of Metals—H. R. Spence and H. W. Hooker, assignors to Hooker Electrochemical Company, Niagara Falls, N. Y.

CLAIM 3. The method of removing from the surface of metals of the group consisting of iron, nickel, cobalt and their alloys with each other and with chromium, manganese, molybdenum, tungsten, vanadium and copper dense firmly adherent oxide that has formed thereon, through exposure to air under oxidizing conditions, which comprises immersing the metal in a fused substantially anhydrous bath consisting of caustic alkali containing 1 to 20 per cent of an oxidizing agent of the group consisting of the alkali-metal and alkaline-earth chlorates, nitrates, dichromates, man-

ganates and permanganates, at 300°–600° C; simultaneously passing electric current through the metal as anode for a least part of the time; and then subjecting the unreduced modified oxide to the action of a dilute inorganic acid.

7 claims, 6 examples.

References cited: U. S. Patents 1,440,092; 2,261,744. British Patent 442,859. Allmand, "Principles of Applied Electrochemistry", 2d ed (1924), pp. 500–501.

No. 2,540,602, February 6, 1951—Method and Apparatus for the Surface Treatment of Metals—F. W. Thomas and Eli Simon, assignors to Lockheed Aircraft Corporation.

CLAIM 6. A device useful in forming anodic films on parts comprising a tubular dielectric member adapted to be grasped and manipulated by the operator, a metal liner in the member, a pad of absorbent material secured in the liner and extending from the end of the member so as to be engaged with the parts being treated, the liner being adapted to contain a supply of electrolyte for wetting the pad, a piston operable in the liner to draw electrolyte into the liner and to force electrolyte from the liner into the pad, and means for conducting electrical current to the liner pad.

7 claims, 4 figures.

References cited: U. S. Patents 203,256; 737,882; 1,416,929; 1,552,591; 1,805,215; 1,908,222; 2,108,700; 2,305,990; 2,408,910. German Patent 673,190. Swedish Patent 2,081. "The Anodic Oxidation of Aluminum and its Alloys as a Protection Against Corrosion," Department of Scientific and Industrial Research, London, England (1926) pp. 8, 9, 12, 13. Ind. Eng. Chem. **39**, 1602–1607 (December, 1947). Trans. Electrochem. Soc. **88**, 325–331 (1946).

No. 2,541,700, February 13, 1951—Electroplating Copper—Donald A. Holl, assignor to E. I. duPont de Nemours & Company.

The objects may be accomplished in accordance with my invention by adding small amounts of certain nonheterocyclic quaternary ammonium compounds either alone or in combination with small amounts of certain betaine-type compounds to cyanide-copper plating baths. I have discovered that the use of such compounds or combination of compounds effects substantial improvements in plating operations from cyanide plating baths and greatly facilitates the obtainment of copper deposits which are pit-free and bright. The extent of the brightening or the anti-pitting action obtained will depend upon the particular compound or combination of compounds employed and also upon the other ingredients of the plating bath and the temperature and conditions under which plating is carried out.

CLAIM 1. A copper plating process comprising electrolyzing an aqueous alkaline copper alkali-metal cyanide solution which contains 0.01 to 1 ounce per gallon of a compound of the formula

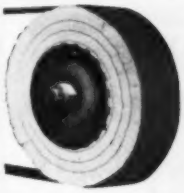
Your best bet's

FORMAX

for

ZIPPO BUFFS

These famous long-wearing buffs run cool under all buffing conditions. Constructed of high count bias-cut cloth mounted on safe steel centers. Available in a wide range of densities and center diameters.



for

STYLE C-20 CONTACT WHEELS and F-26 Belt Lubricant

A C-20 flexible Contact Wheel will form itself to the shape of the work and permit the abrasive belt to polish contoured surfaces and F-26 Abrasive Belt Lubricant will increase belt life by preventing loading and glazing. Produces finer, smoother and brighter surfaces through lubrication.

for

BUFFING COMPOUNDS

A complete line of production buffing compounds. Produced in bar and tube form. Formax is the originator of the "Spraymax" Liquid Compounds for brush or spray application.

for

FLEX-A-GLU POLISHING WHEEL CEMENT—A flexible synthetic adhesive in a ready-to-use form. Dries quickly. Increases polishing wheel life and produces uniform finishes regardless of grit size used.

Send for Descriptive Literature

FORMAX

FORMAX MANUFACTURING CORP

3171 Bellevue Ave. DETROIT 7, MICH.

MANUFACTURED IN CANADA BY JOHN GALLOWAY LTD., KITCHENER, ONT.

How Good Are You at Remembering Faces?

Wilfred McKeon

Look me up at the Buffalo Convention. I'd like to talk to you about improving your bright zinc plating with

McKeon's **Zinc-Brite**

•

Sulphur Products Co. Inc.
Greensburg, Pa. 8

USE READER SERVICE CARD; INDICATE A 639.

Born in CHICAGO

NARACO'S *NEWEST* ADDITION

AMERICAN RACK CO.
23-24 West Lake St.
Chicago, Ill.

for

- PLATING
- ANODIZING
- PAINTING
- CONVEYOR RACKS

Serving Eastern Industrial Area
NATIONAL RACK COMPANY, INC.
179-181 Madison Street — Paterson, New Jersey

Serving Mid-Western Industrial Area
IMPERIAL PLATING RACK CO.
1613 Industrial Avenue — Flint, Michigan

$$(CH_3)_3 \equiv N - X$$
$$\quad\quad\quad

Time, temperature and current density depend on the material being polished. Acceptable finishes can be obtained on 2B stainless steels of the 321–302–304 grades in from 3½ to 10 minutes at temperatures of 60–75° C with current densities of from 50 to 250 amp per sq ft. pressure from 3.5 to 7 volts.

CLAIM 4. A process for anodic polishing of a metal selected from the group consisting of iron, steel, nickel and nickel electroplates which comprises immersing the metal in an electrolytic solution consisting of a mixture which is by volume the equivalent of a mixture of from 40 to 65 per cent of an aqueous solution of sulfuric acid of 66° Baumé, the equivalent of from 5 to 20 per cent of a 26 per cent aqueous solution of fluoboric acid and the remainder water; and passing a direct electrical current from the metal to be cleaned through the solution and to a cathode immersed in the solution.

4 claims, 3 examples.

References cited: U. S. Patents 2,153,060; 2,414,326. British Patent 530,041, Metal Finishing 45, 63–67 (February, 1947).

No. 2,542,994, February 27, 1951—Electrolytic Surface Treatment of Steel—Harold W. Cobb, assignor by mesne assignments to Armco Steel Corporation.

CLAIM 4. In treating alloy-steel articles containing at least 10 per cent chromium to obtain a hard, adherent, abrasion-resisting surface, the art which comprises electrolytically polishing such articles, then surface blackening the polished articles in a fused salt balth containing substantially all salt of the group consisting of sodium dichromate and potassium dichromate at a temperature of 320 to 500° C for a period ranging from 2 to 30 minutes time, and after at least said 2 minutes blackening time subjecting the articles to electrolytic cathodizing treatment in said fused salt bath at a current density of 0.05 to 4 amperes per square inch of article area immersed for a period of at least 5 minutes.

5 claims.

References cited: U. S. Patents 1,795,512; 1,845,978; 1,927,773; 1,975,239; 2,261,744; 2,394,899; 2,426,962. French Patent 695,366. Hacklis' "Chemical Dictionary", 3rd ed (1944), pp. 198–199.

CHEMSTEEL CONSTRUCTION COMPANY, INC.
303 Chemsteel Building, Walnut Street, Pittsburgh 22, Pa.

Send data on your Design, Engineering, Material, Construction and Maintenance Facilities for

ACID-ALKALI-PROOF CONSTRUCTION

backed by experience serving major steel, chemical, textile and food industries in erection of

PICKLING, PROCESSING & STORAGE TANKS & FLOORING

NAME.....
COMPANY.....
ADDRESS.....
CITY.....ZONE.....STATE.....
(TEAR OUT AND MAIL)

USE READER SERVICE CARD; INDICATE A 642.

FOR YOUR INDUSTRIAL RUBBER NEEDS

SEE

Miller Products Co.

"Industrial Rubber Headquarters"

Write or telephone today for information and prices on our complete line of super quality Industrial Rubber Products at low prices. Immediate delivery from our New York City warehouse of the following:

- APRONS
- BUCKETS
- GLOVES
- FUNNELS
- CLOTHING
- TUBING
- FOOTWEAR
- DIPPING BASKETS

Send for your FREE copy of our new, fully illustrated catalogue NOW!

If You Buy Industrial Rubber Products It Will Pay You To Get Acquainted With

MILLER PRODUCTS COMPANY, INC.

33P Warren St. — SUPER MP QUALITY RUBBER PRODUCTS — New York 7, N.Y.

COrtland 7-5335

USE READER SERVICE CARD; INDICATE A 643.

Quality Chemicals for over 50 years

PHELPS DODGE REFINING CORPORATION
NICHOLS TRIANGLE BRAND
REG. U.S. PAT. OFF.
CHEMICALS
40 WALL ST. NEW YORK

COPPER SULPHATE

NICKEL SULPHATE

USE READER SERVICE CARD; INDICATE A 644.

FOR SALE

110,000

AIR-COOLED BUFFS

(Slightly Used)

12"—13" Diameter

1¼" Arbor

Samples Submitted

MICHIGAN BUFF CO., INC.

3503 GAYLORD AVENUE

DETROIT 12, MICHIGAN

USE READER SERVICE CARD: INDICATE A 645.

BEAM-KNODEL CO.

Distributors for

HANSON-
VAN WINKLE-
MUNNING CO.'S

"PLATEMANSHIP"

A Complete Service

for **Electroplating, Polishing and Buffing, Cleaning and Anodizing**

195 LAFAYETTE STREET

CA 6-3956-7 New York 12, N. Y.

No. 2,543,545, February 27, 1951—Electrodeposition Bath for Bright Zinc—Charles L. Faust, A. E. Bearse and A. W. Liger, assignors by mesne assignments to The Meaker Company.

A preferred addition agent is sulfonated 8-phenylquinaldine. Incorporation of a small amount of this material in an aqueous acidic zinc sulfate bath containing a buffering agent, such as boric acid, makes it possible to obtain bright and ductile zinc plates by electrodeposition.

The composition of one type of bright zinc plating solution is indicated below:

	Approximate Limits g/l		
Material	*lower*	*upper*	*preferred*
$ZnSO_4 \cdot 7\,H_2O$	300	800	450
H_3BO_3	15	45	30
8-phenylquinaldine sulfonation mixture	0.02	5	0.04

CLAIM 1. An electrodeposition bath comprising an aqueous acid zinc sulfate solution containing a buffering agent and sulfonated 8-phenylquinaldine in sufficient amount to obtain a bright zinc plate, said bath having a *p*H between 3.3 and 4.3.

CLAIM 3. . . . containing 300 to 800 grams per liter of zinc sulfate heptahydrate, between 15 and 45 grams per liter of boric acid and between 0.01 and 5 grams per liter of a mixture of sulfonates of 8-phenylquinaldine.

5 claims, 6 examples.

References cited: U. S. Patents 733,028; 905,837; 2,370,986; 2,407,489. Blum & Hogaboom, "Principles of Electroplating and Electroforming" (1930), p. 321. Metal Industry **37**, 433–436 (November 29, 1940).

No. 2,544,510, March 6, 1951—Apparatus and Method for Plating Strips—F. A. Prahl, assignor to National Steel Corporation.

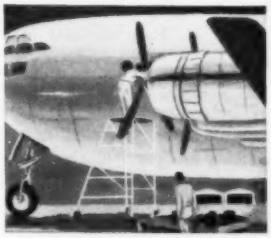
CLAIM 2. Apparatus for electroplating longitudinally moving strip having a conductive face in contact with the electrolyte comprising an anode support having a conductive surface submerged in the electrolyte; means for connecting a source of electroplating potential to the conductive surface of the anode support; an anode submerged in the electrolyte and including a plurality of elongated elements extending transversely of the conductive face of the strip and supported by the anode support, said anode elements being in contact with the conductive surface of the anode support so that electroplating of the anode metal on the conductive face of the strip progressively corrodes the anode elements and reduces them in size; and adjustable cam means including rotatable cams submerged in the electrolyte and operatively associated with the anode support, said cams being rotatable to move the anode support and the anode elements toward the conductive face of the strip to compensate for corrosion of the anode elements and to maintain the anode support

USE READER SERVICE CARD: INDICATE A 646.

CRITICAL PLATING METALS CONSERVED

B&A METAL FLUOBORATES HELP INCREASE PLATING OUTPUT AND CUT COSTS!

VERSATILE B&A FLUOBORATE ELECTROLYTES PRODUCE EVEN, FINE-GRAINED COATINGS QUICKLY, ECONOMICALLY



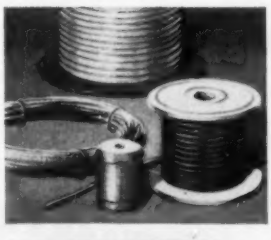
Alloy Coating Formed in One Operation!

In plating airplane and heavy duty automobile bearings, B&A lead and tin fluoborate solutions produce an alloy coating in one operation that is harder, more wear-resistant than lead plate alone! This fluoborate alloy bath is also used to produce protective coatings on pistons, other engine parts . . . a 0.0002 in. deposit provides vital lubrication during break-in periods.

Lead-Tin Alloy Makes Soldering Easy!

B&A lead and tin fluoborate produce coatings of excellent solderability on radio or electrical parts where use of non-corrosive flux is desirable...with plated parts retaining these characteristics over long periods.

Where parts can be fused, the fluoborate alloy bath can also be used to deposit solder and thus eliminate costly, time-consuming hand soldering operations.



Electroclad Wires Save Critical Metals

Bi-metal wires—wires coated with tin, lead, nickel, lead-tin alloys, etc.—are replacing solid wire fabricated entirely of scarce metals. Needed lubrication properties for drawing are also imparted.

Electroplaters find Fluoborates offer Fast, Easy, Economical Method that Saves Substantial Amounts of Tin, Copper, Cadmium . . . other metals

THE STAND-OUT PERFORMANCE of B&A Metal Fluoborates in lead, tin, copper, and nickel plating operations is now enabling platers to increase production and, in many cases, effect real savings on metals in short supply.

THAT'S BECAUSE Baker & Adamson's Metal Fluoborates offer electroplaters an unusual combination of important advantages *not available in other plating agents.* Why not consider how important each one can be in terms of efficiency and economy in your operations, then contact your nearest B&A office today?

9 *IMPORTANT ADVANTAGES INCREASE PLATING EFFICIENCY*

1 No dissolving necessary . . . supplied in concentrated solution form
2 Easier bath preparation
3 Stability of bath composition
4 Ease of control
5 Practically 100% anode and cathode efficiency
6 High conductivity
7 Good covering power
8 Fine-grained deposits of good color
9 Faster, high-speed operation

Write Today!

For detailed operating data, experimental samples or commercial quantities of lead, tin, copper, or nickel fluoborate solutions, write or phone nearest B&A office. When planning special operations, draw on the knowledge and experience of our technical specialists in setting up baths for test or full scale runs.

REAGENTS
B&A
STANDARD OF PURITY
FINE CHEMICALS

BAKER & ADAMSON *Fine Chemicals*

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

Offices: Albany • Atlanta • Baltimore* • Birmingham* • Boston • Bridgeport* • Buffalo* • Charlotte* Chicago* • Cleveland* • Denver* • Detroit* • Houston* • Jacksonville • Los Angeles* • Minneapolis New York* • Philadelphia* • Pittsburgh* • Providence* • St. Louis* • San Francisco* • Seattle • Yakima (Wash.) In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal* • Toronto* • Vancouver*

SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

*Complete stocks are carried here.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 647.

BUFFALO DAYCO BRAND

Manufacturers of

"BUFFALO"

- BUFFS
- POLISHING WHEELS
- COMPOSITIONS

Distributor of

PLATERS' BRUSHES • WIRE WHEELS
ABRASIVES • PLATING CHEMICALS
PLATING AND POLISHING
SUPPLIES AND EQUIPMENT

S. A. DAY MFG. CO.
INC.
1483-85 NIAGARA ST. BUFFALO 13, N. Y.

USE READER SERVICE CARD; INDICATE A 648.

Zialite
Reg. U. S. Pat. Off.

for HARD CHROMIUM

USE
Zialite ADDITION AGENTS
Harder deposits.
Increased throwing power.
Less sensitivity to sulfate content.
Exceptionally fine results plating anything calling for Decorative or Hard Chrome.

for NICKEL PLATING

The one bath especially designed for plating DIRECTLY on ZINC, LEAD ALUMINUM, BRASS, COPPER and IRON.

ZIALITE CORPORATION
92 Grove Street Worcester 5, Mass.

USE READER SERVICE CARD; INDICATE A 649.

Patent Abstracts

and anode elements in the proper operative position adjacent to the conductive face of the strip, said adjustable cam means including actuating means external of the electrolyte for rotating the cams to move the anode support.

22 claims, 6 figures.

References cited: U. S. Patents 682,155; 733,602; 872,235; 954,833; 966,097; 1,435,671; 1,437,003; 1,647,743; 1,900,534; 2,053,279; 2,212,588; 2,264,857; 2,310,561; 2,312,452; 2,382,018; 2,399,254; 2,458,912. British Patents 3,431; 22,543; 479,896.

No. 2,545,566, March 20, 1951—Electrodeposition of Metals and Alloys—J. M. Booe, assignor to P. R. Mallory & Company, Inc.

In many plating operations of the prior art a great deal of trouble has been experienced in obtaining smooth, uniform deposits over extended periods of time. . . . The troubles are particularly marked in alloy plating such as in the deposition of silver-lead alloys. For example, a new solution for silver-lead plating will satisfactorily deposit silver-lead for the first several hours. However, with continued operation the deposit becomes increasingly rough, and after ten to fifteen hours' operation it is so rough as to be useless. Continuous or periodic filtering will not adequately keep the bath free of these fine particles originating at the anode or prevent them from reaching the cathode. . . . I have found that the anode surface condition can be changed by increasing the anode current density. . . . In raising the anode current density the anode size is reduced for a given cathode area.

Silver-lead bath	*Grams per liter*
Silver cyanide	120
Potassium cyanide (total)	205
Free potassium cyanide	145
Potassium tartrate	100
Lead tartrate	6
Potassium hydroxide	10
Pyrogallol	0.5

Sell It THRU WAGNERS

WE WANT new products to sell. We want new ideas to develop for the national metal finishing market. Our active sales force is your assurance of volume. Our technical staff will develop or service your product, our manufacturing facilities will produce it, and our sales organization will distribute it nationwide with profit and protection for you.

Phone, wire or write
JOE WAGNER
Wagner Bros., Inc.
Midland at Ross
Detroit 3, Mich.

USE READER SERVICE CARD; INDICATE A 650.

The plating circuit and the amount of solution agitation, together with the relative size of the anodes and cathodes, are arranged so as to provide a current density at the lead anode of 30 to 50 amperes per square foot, preferably 40 amperes, with a current density at the silver anode of 200 to 600 amperes per square foot preferably 300 amperes, and a current density at the cathode of 45 to 90 amperes per square foot of cathode area. The lead anode has an area of about 1/10 to 1/30 of that of the cathode while the silver anode has an area of about 1/5 of that of the cathode. The preferred operating temperature is 35 to 50° C with moderate agitation, for example 45° C.

Copper-lead bath	*Grams per liter*
Copper cyanide	165
Potassium cyanide (total)	247
Free potassium cyanide	15
Potassium hydroxide	15
Potassium tartrate	50
Lead acetate	10
Pyrogallol	0.5
Sorbitol	60

The *p*H is adjusted to 13.5 and the temperature to 70° C. The preferred cathode current density is 45 amperes per square foot, copper anode current density 180 amperes per square foot, lead anode current density 65 amperes per square foot and agitation approximately 20 feet per minute past the cathode surface. With 38 per cent of the current through the lead anode and 62 per cent through the copper anode, the lead anode voltage may be 0.75 to 1 volt, and the copper anode voltage 1.0 to 1.4 volts.

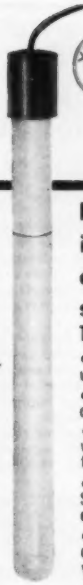
CLAIM 1. The method of electrodepositing lead from an aqueous alkaline bath containing soluble lead salts which comprises employing a lead anode having an effective surface area less than 0.5 the surface area of the cathode to be plated and passing an electric current therethrough at an anode current density of about 30 to 50 amperes per square foot of effective anode surface area, said current density being less than that required to polarize said anode and greater than that at which anode current density increases substantially proportional to the increase in impressed voltage.

CLAIM 2. The method of electrodepositing lead which comprises passing an electric current through

PLATING GENERATORS Etc.

1—5000 amp., 6 volt, Chandyson generator to a 60 HP., 3 phase, 60 cycle, 220 volt, .8 P.F., 360 RPM., General Electric Synchronous motor.
1—2000 amp., 6 volt, Jantz & Leist interpole generators connected to 20 HP., 3 phase, 60 cycle, 570 RPM. type KT-332 Gen. Elec. motors.
1—1200 amp., 35 volt, 575 RPM. Star ball bearing generator with AC motor.
1—1000 amp., 40 volt, 600 RPM. Burke ball bearing generator with AC motor.
2—600 amp., 40 volt, 1800 RPM., type SK126L Westgh. generators with AC motors.
1—300 amp., 25 volt, 1750 RPM., type SK-110L Westgh. generator with AC motor.
6—500 amp. Gen. Elec. Rectifiers, 3 phase, 60 cycle, 220 volts to 6 volts D.C.
1—800 amp., 6 volt, Jantz & Leist to a 10 HP., 685 RPM., 3 phase motor.
1—500 amp. Hansen Van Winkle, 6 volts to a 5 HP., 3 phase General Electric Motor.

Keystone Power Plant Equipment Co.
8411 Hegerman Street, Philadelphia 36, Pa.



NOW YOU CAN GET THE
NEW TYPE VITREOSIL®
(pure fused silica)
ELECTRIC IMMERSION HEATERS

Here is the latest improvement in immersion heaters for heating acid pickling and electro-plating solutions, and other acid baths.
This new VITREOSIL immersion heater features:

- Increased heat transfer per unit area
- Greater resistance to chemical attack
- Molded rubber cap providing efficient sealing and facilitating installation
- Ground wire inside VITREOSIL sheath for additional electrical protection
- Minimum safe immersion depth marked on each heater

Write today for bulletin No. 14 giving specifications and prices

THE THERMAL SYNDICATE, LTD.
12 East 46th Street New York 17, New York

USE READER SERVICE CARD: INDICATE A 652.

Filter your solutions
1,000 TIMES FASTER
ELIMINATES PITTING and ROUGH DEPOSITS

SETHCO FILTER PUMPS do the job faster, more efficiently, more economically.

- Ideal for both continuous and periodic filtration.
- Corrosion proof stainless steel construction.
- No loss of expensive solutions; crystal clear filtration.
- High temp. filter cylinders—transparent lucite or stainless steel.
- Capacity 50-100 gals./hr.; simple operation.

Write today for descriptive literature

SETHCO 105-01 150th STREET JAMAICA 4, N. Y.

USE READER SERVICE CARD: INDICATE A 653.

Conversion Headaches?

HAVING TROUBLE FINISHING SUBSTITUTE MATERIALS?

We have the answers to those material substitution problems. Send your conversion headaches to us . . . our FREE technical and engineering service is available at no obligation to you. Let us prove to you that the "*AIRFLOW*" buffs and methods will save you production time, machine time, labor and money. Take advantage of our research laboratories and proven case histories in our files.

Available in various constructions and densities for specific applications, our patented* "*AIRFLOW*" buff provides excellent finish and increased production. Using the proper "*AIRFLOW*" buffs and methods, you will be amazed at the quality of the work and the time saved in your finishing operations. Compare them with your present wheels.

Hundreds of concerns have consulted us regarding their material conversion problems and have quickly received *CORRECT* answers. If you have one of those "tough" finishing jobs . . . send it to us.

Write for further details and send your samples to:

Airflow

UNITED BUFF PRODUCTS CORPORATION

233 OAK STREET PASSAIC, N. J.

THE *Pressure-Cooled* BUFF

* Patent No. 2,519,275. Other U. S. and foreign patents pending.

Certain sales territories still available

USE READER SERVICE CARD; INDICATE A 654.

Corrosion Proof Construction Materials

CEMENTS FLOORS LININGS COATINGS

Rely on Atlas' years of experience and recognized leadership to help solve your problems. Write 32 Walnut Street, Mertztown, Pa.

Over a half century of service

ATLAS

Atlas

MINERAL PRODUCTS COMPANY

MERTZTOWN, PA. HOUSTON, TEXAS

USE READER SERVICE CARD; INDICATE A 655.

RECLAIM YOUR NICKEL ANODES

Why sell your used nickel anodes for scrap? We will reclaim your own nickel anode scrap and convert it into cast oval nickel anodes maximum 36" in length, at a nominal charge. This gives you a considerable saving over the purchase of new nickel anodes, and assures you of a constant supply of anodes.

WRITE FOR COMPLETE INFORMATION

NEW JERSEY METALS COMPANY

712 ROCKEFELLER ST., ELIZABETH 2 N. J.

an aqueous plating bath containing lead ions, tartrate ions and cyanide ions from a lead anode to a cathode to be plated at an anode current density of about 30 to about 50 amperes per square foot of effective anodic surface, said anode current density being less than that required to polarize said anode and greater than that at which anode current density increases substantially proportional to the increase in impressed voltage, said lead anode having an effective surface area about 1/10 to about 1/30 of that of said cathode.

2 claims, 7 figures.

References cited: U. S. Patents 1,077,920; 1,306,179; 1,461,276; 1,800,206; 2,020,382; 2,079,842; 2,171,842; 2,176,668. Baier, Metal Industry **60**, 435–438 (June 26, 1942). Trans. Electrochem. Soc. **74**, 246–249 (1938); **75**, 187–189 (1939); **81**, 199–211 (1942).

No. 2,546,150, March 27, 1951—Method for Securing Adhesion of Electroplated Coatings to a Metal Base—Abner Brenner, Polly S. Burkhead and Grace E. Riddell, assignors to United States of America as represented by Secretary of War.

CLAIM 19. The method of improving the adhesion to a cobalt base of an electrolytically co-deposited alloy of tungsten and a metal of the group consisting of iron, nickel and cobalt, which method comprises the steps of making the cobalt base an electrode in an electrolytic bath from which one of said tungsten alloys can be plated upon said base, and passing alternating current at a current density of from about 0.25 to 1 ampere per square decimeter (2.3–9.3 asf) through said bath and through said base for from about 5 seconds to several minutes immediately prior to co-depositing the alloy from said bath upon said base by passage of direct current through the bath and through the base.

Claim 20. . . . which method comprises the steps of making the nickel base an electrode. . . .

20 claims.

References cited: U. S. Patents 811,759; 1,600,355; 2,063,760; 2,080,506; 2,160,321; 2,264,857; 2,363,973; 2,370,108; 2,432,893; 2,432,894. Cocks, "Some Possible Uses of Alternating Currents in Electrodeposition", Metal Industry **34**, 396–398 (April 19, 1929). J. Research Natl. Bureau Standards **39**, No. 4, 351–352, 353, 361–362 (October, 1947).

No. 2,546,920, March 27, 1951—Electroplating and Electropolishing Apparatus—C. Cupps, assignor to Standard Steel Spring Company.

CLAIM. In electroplating and electropolishing apparatus, a substantially vertically extending support for an article, said support being connected in an electric circuit, a supporting arm connected at its inner end to said support and having at its outer end a locating pin adapted to be received in a hole formed in the article, an electrical contact connected to said support below said supporting arm and contacting the article over an area at least several times greater than the area of contact between the article and said

over one million amps of Sel-Rex PLATING POWER

PROVEN PERFORMANCE

WE are proud of the success record Sel-Rex Selenium Rectifiers enjoy in the world's largest plating plants . . . (one company alone has over 56,000 amps of Sel-Rex Plating Power).

The largest single unit rectifier built to date is a Sel-Rex development. No matter how small or large your power requirements may be, Sel-Rex Rectifiers can be designed and built to suit your special needs. Being long experienced in the field of electroplating and electroforming is why we are rated top specialists in the industry when it comes to plating power.

Automatically controlled by this operating panel

BART-MESSING CORPORATION

229 Main Street Belleville 9, N. J.

Manufacturers and distributors of Plating and Polishing Equipment and Supplies.

SELENIUM Sel-Rex RECTIFIERS

The Better WAY
IS
For You to Judge

SEELEY'S
COMPOUNDS

For All Industrial
Polishing—Buffing
Burring Applications

•

E. E. SEELEY COMPANY, INC.
900 HOUSATONIC AVENUE
Phone 5-0943 BRIDGEPORT 1, CONN.

USE READER SERVICE CARD: INDICATE A 658.

DIXRIP
fine wire
SCRATCH BRUSHES

FOR SILVERSMITHS, PLATERS, JEWELRY MFGRS., ETC.

Supplied in brass, steel or nickel silver wire in sizes .0025-.006 or bristle, Nylon or fibre.

Special sizes and shapes to order.

Write us for catalog and price list.

DIXON & RIPPEL, INC. KINGSTON, N. Y.
Established 1856

USE READER SERVICE CARD: INDICATE A 659.

AURALITE
TRADE MARK
The Original Water Soluble Gold Alloy Salt

AURALLOY
PROCESS PAT. PEND.

PLATERS RESEARCH CORPORATION

USE READER SERVICE CARD: INDICATE A 660.

Patent Abstracts

locating pin, a spring connected to said support and extending below said electrical contact, and a hook connecting said spring and article for holding the article tightly against said electrical contact, said hook having a body portion passing through an opening in the article, an enlarged head for retaining the hook in place, and a curved portion for removable engagement with said spring.

1 claim, 1 figure.

References cited: U. S. Patent 1,308,508. Appl. Ser. No. 290,026, Weiner (A.P.C.), published July 13, 1943. "Belke Plating Rack Manual", Belke Manufacturing Company, Chicago, Ill. (1947), pp. 49 and 99.

No. 2,547,120, April 3, 1951—Process for Plating a Carbon or Graphite Part with Chromium—R. S. Herwig, assignor to Bendix Aviation Corporation.

CLAIM 1. A process for chromium plating a carbon part; comprising the steps of first soaking the carbon part in an alkaline cleaning solution including three ounces of sodium hydroxide and two ounces of sodium carbonate per gallon of water; second, subjecting said carbon part to a reverse-current clean for a period of between five and fifteen seconds and at a temperature of 160° F; third, passing an electric current through the carbon part at a current density considerably in excess of . . . 50 amperes for each square foot of effective surface area of carbon part and at a relatively high voltage while the carbon part is functioning as a cathode in a CrO_3–SO_4 acid plating bath and in which the carbon part is separated from the anode at a distance of from 1/16 to ½ inch; fourth, reducing the voltage initially applied to the carbon part after initial chromium plating has been effected and plating at a current density less than before but . . . at least 50 amperes for each square foot of effective surface area of the part.

2 claims.

References cited: U. S. Patents 330,247; 1,403,903; 1,787,477; 1,967,716; 2,069,206; 2,118,956. French Patent 643,538. Trans. Electrochem. Soc. 80, 589, 593 (1941).

PRICED TO SELL!

MOTOR GENERATORS
Reliably Rebuilt
1 Year Guarantee

6/12 VOLTS
1—5000/2500 A., Optimus, 490 RPM.
1—1000/500 A., H-V-W, 1150 RPM.
8—125 A., Hobart, 6 volts.

15 to 25 VOLTS
1— 200 A., 15 V. Master
1—1000A., 15 V. Gen. Elec.
1— 300 A., 15 V. Star
1— 750 A.,20 V. M. G. Corp.
1— 800 A., 22/33 V. Gen. Elec.

24 VOLTS
2—1500 A. Century
1—2500 A. Gen. Elec.
2—3000 A. Electric Products

1— 600 A., 24 V. Reliance
1— 200 A., 25 V. Star
1— 300 A., 25 V. Star
1— 175 A., 25 V. Cr. Wh.

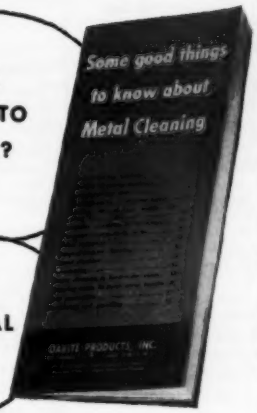
32 to 60 VOLTS
1— 500 A., 32 V. Columbia
2— 100 A., 30 V. Gen. Elec.
1— 200 A., 30 V. West.
2— 200 A., 32 V. Gen. Elec.
2—1500 A., 32/40 V. Century
1—1000 A., 33 V. Gen. Elec.
2—1000 A., 40 V. Chandeysson
2— 200 A., 42 V. Gen. Elec.
3—1500 A., 45 V. Century
1—1500 A., 50 V. Gen. Elec.
2— 800 A., 50 V. Gen. Elec.
1— 400 A., 50 V. Gen. Elec.
6—1500 A., 50 V. Century
1—1000 A., 60 V. Gen. Elec.

L. J. LAND, Incorporated
136 Grand Street, New York 13, N. Y. CAnal 6-6976
Established 1910

USE READER SERVICE CARD: INDICATE A 661.

WHAT'S THE FASTEST WAY TO CLEAN METAL?
See page 11

WHAT'S THE MOST ECONOMICAL WAY?
See page 9



Oakite's New FREE Booklet

"Some good things to know about Metal Cleaning"

answers many questions that mean better production for you, more money in your pocket. You'll want to read more about:

Can one cleaning material do all metal-cleaning jobs? *See page 5.*

What kind of cleaner attracts both oil and water? How does this help remove buffing compound residues and pigmented drawing compounds? *See page 8.*

What are the advantages of reverse current for electrocleaning steel? *See page 15.*

For nonferrous metals, what are relative advantages of cathodic, cathodic-anodic and soak-anodic cleaning? *See page 17.*

Can you electroclean brass without tarnishing? *See page 18.*

Would you like a cleaner that removes rust and oil in one operation, often eliminating all need for pickling? *See page 28.*

Does your burnishing produce a luster you are proud of? *See page 32.*

FREE For your copy of this 44-page illustrated booklet, write Oakite Products, Inc., 40 Thames St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

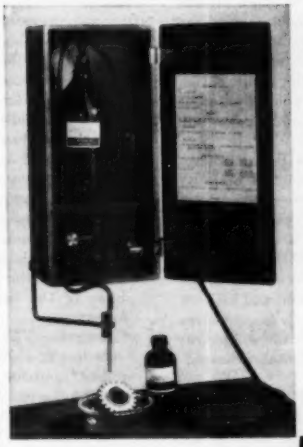
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. & Canada

Save MONEY Save TIME Save MATERIAL

With KOCOUR Automatic DROPPING UNIT

For determining thickness of Cadmium, Zinc, Copper and Tin Deposits



● The KOCOUR automatic dropping unit is electrically operated . . . is invaluable for rapidly checking the thickness of plated deposits . . . the set is designed to deliver at the proper dropping rate and to time the interval it is in operation. . . . This eliminates the need of any other timing device. . . Overplating and underplating are both expensive since one wastes time and material and the other leads to rejects.

Comes compactly assembled in a well made cabinet . . . easily mounted on a wall or upright, convenient to a 110 volt, 60 cycle, A.C. electric outlet.

● The manually operated set uses the same solutions as the automatic set but the dropping rate must be adjusted by hand and a timing device must be used. . . The principles involved are the same—that of dropping a corrosive solution at a definite rate onto a plated article until the base metal is exposed.

● KOCOUR testing sets are used all over the world for controlling plating — cleaning — pickling — anodizing — and hardening processes . . . special sets can be provided for your requirements.
Write today for complete information — no cost or obligation.

KOCOUR COMPANY
4801 S. ST. LOUIS AVENUE
CHICAGO 32, ILLINOIS

Specify KOCOUR test sets from your supplier.

A. E. S. News

Executive Board Offers Amendments to Constitution and By-Laws

A recommendation and approved motion of the Executive Board amending the Constitution and By-Laws to increase the Per Capita Tax for strengthening the general finances of the Society and the Research program.

RECOMMENDATION of the Executive Board:

Heavy general increases in costs of services and commodities have threatened the financial position of the Society to a degree which the Executive Board, although it has exerted itself to the best of its abilities to promote economy and efficiency in the management of the Society, finds itself unable to offset without damage to our fundamental purposes. Further major economies would involve drastic curtailment of established functions and services; and the Board is convinced such curtailment would weaken us as a society and run counter to the will of our membership.

At the same time, the Board believes there is a conviction among the majority of our members that the Research program merits from the whole Society the same direct support and endorsement which a number of public-spirited Branches have given it as free-will underwriting. The Board shares this conviction and believes further that a willingness to tax ourselves for this end will stimulate the willingness of eligible firms to contribute as Sustaining Members.

For these reasons the Executive Board recommends that effective April 1, 1952, the Per Capita Tax be increased in the way and by the amount stipulated in the amendment submitted herewith and approves this proposed amendment for submittal to the 1951 Convention of the Society. It should be noted that minimum dues are not mentioned in the amendment, Branches being left free to adjust above minimum as they may deem wise.

MOVED: that the Constitution and By-Laws of the Society be amended as follows:

Constitution: I, V, 3: *Per Capita Tax.* Strike out the portion following the words "Per Capita Tax" and substitute the following: "of seven dollars and fifty cents ($7.50) of which (a) one dollar ($1.00) shall be paid into the Society's funds to be expended only for research and (b) a further part shall be used to pay the annual subscription to the official journal of the Society at one-half the regular subscription price."

By-Laws: I, V, 3: *Per Capita Tax.* In line 2, strike out "$4.70" and substitute "seven dollars and fifty cents ($7.50)".

By-Laws: II, V, 5: *Treasurer.* In line 5, strike out "$4.70" and substitute "seven dollars and fifty cents ($7.50)".

I certify that the above motion has been reviewed by the Law Committee of the Society and is found suitable for immediate publication and vote.

LAW COMMITTEE:
MANSON GLOVER
Chairman
May 28, 1951

A recommendation and approved motion of the Executive Board amending the Constitution and By-Laws to exempt Branches from payment of Per Capita Tax for Student Members.

RECOMMENDATION of the Executive Board:

In view of the present small student membership of the Society and the consequent insignificant revenue derived from Per Capita Tax for such membership, and believing that diversion of nearly the entire annual dues of Student Members to Per Capita Tax may be a deterrent in campaigning for such members and so an obstacle to the growth of the Society, the Executive Board recommends adoption of the following amendment eliminating the Tax for this class.

MOVED: That the Constitution and By-Laws of the Society be amended as follows:

Constitution: I, V, 3: *Per Capita Tax.* In line 2, strike out the word "Student" and the commas that precede and follow it.

By-Laws: I, V, 3: *Per Capita Tax.* In line 3, for "member" substitute "Active Member".

By-Laws: II, V, 5: *Treasurer.* In paragraph 2, line 4, for "member" substitute "Active Member".

I certify that the above motion has been reviewed by the Law Committee of the Society and found suitable for immediate publication and vote.

LAW COMMITTEE:
MANSON GLOVER
Chairman
May 28, 1951

New Sustaining Members

As can be seen in the Annual Reports in this issue the number of sustaining members of the Society continues to grow. Here we are pleased to welcome three who recently joined the ranks of those who support the A. E. S. research program:

Allen-Bradley Company, Milwaukee, Wis.

American Flange & Manufacturing Company, Chicago, Ill.

Precision Castings Company, Syracuse, N. Y.

Branch Speakers List

This list, which is usually published in the July issue, will this year appear in the August issue.

It is hoped that this delay will not seriously embarrass those in charge of planning the year's program for their Branch.

Important Decisions at Executive Board Meeting

The meeting of the Executive Board on May 19–20 in Statler Hotel, Buffalo, N. Y., was attended by President W. J. Neill, First Vice-President C. F. Nixon, Second Vice-President F. J. MacStoker, Third Vice-President G. P. Swift, Past Presidents S. S. Johnston and K. M. Huston, and Executive Secretary A. K. Graham.

INDUSTRIAL FINISHING EXPOSITION

The agreement with Glassner & Associates for handling the Industrial Finishing Exposition in the International Amphitheatre, Chicago, Ill., on June 16–20, 1952, was approved.

The I. F. E. Committee, of which Clyde Kelly of the Chicago Branch is Chairman and H. E. Head of the Detroit Branch is Vice-Chairman, was appointed the authorized agents of the Society in all matters pertaining to the 1952 Exposition.

COMMITTEE ON SUBSTITUTE MATERIALS

Consideration is being given to the organization of a special task committee to explore substitutes for currently critical and strategic plating material.

SOCIETY REPRESENTATION

W. L. Pinner was appointed the Society's representative on both the Copper and Nickel Subcommittees of the S. A. E. Technical Committee on Substitutes for Critical Nonferrous Materials.

Dr. R. M. Wick is continuing to serve as one of the A. E. S. representatives on the Inter-Society Corrosion Committee. A second representative is to be appointed in the near future to replace K. M. Huston, who has retired after several years of very active service on this committee.

CORRESPONDENCE COURSE

Progress was reported with respect to the development of an A. E. S.-sponsored correspondence course on electroplating. It is hoped that this matter will be ready for announcement at the Annual Meeting.

INTERNATIONAL COMMITTEE FOR ELECTRODEPOSITION

The idea of establishing an International Committee for Electrodeposition was approved, and it was agreed to participate by appointment of two representatives. The object of this committee is

to initiate and coordinate all activities of member societies where international action is necessary or desirable. Such activities may include holding of international meetings, dealing with questions of nomenclature and terminology, and representing international interests of the science and art of electrodeposition. The Electrodepositors' Technical Society of Great Britain has taken the initiative in promoting the organization of this important committee.

A. E. S. Specifications

A. E. S. sponsorship and approval of electroplating specifications and recommended practices originating with Committee B-8 of A. S. T. M. has been a subject of some controversy for a number of years. George B. Hogaboom's agitation for clarification and improvement of the procedures has finally borne fruit. Through the efforts of B. C. Case, the current Society liaison to Committee B-8, a procedure has been formulated which the Board unanimously decided to recommend to the Supreme Society at the coming Convention:

1. That a committee be appointed to represent the A. E. S. "that will be on the ground floor during the time that A.S.T.M. reports are being formulated" so that when the official A. E. S. seal is to be used, necessary permission can be obtained with a minimum of delay.

2. That the Society's liaison representative be the Chairman of this committee.

3. That members of A. S. T. M.'s Committee B-8 Advisory Committee who are also members of A. E. S. be appointed to this A. E. S. committee. (A. S. T. M.'s B-8 Advisory Committee is as follows: C. H. Sample, B. C. Case, Marc Darrin, Max Frager, K. M. Huston, H. A. Pray, R. B. Saltonstall, K. G. Soderberg, and J. E. Stareck. With the exception of Darrin and Frager, these men are members of A. E. S.).

4. That this A. E. S. committee notify the President or the Executive Secretary when permission to use the A. E. S. seal is desired, and provide necessary copies of the specification or recommended practice in question for Executive Board consideration.

5. That the Executive Board vote on the Committee's recommendation and notify its liaison representative of the results as soon as possible.

Research Finance

William M. Tucker, Eastman Kodak Company, Rochester, N. Y., is now District Supervisor for the Research Committee's fund rasing efforts in all New York State Branches except New York Branch.

R. F. Ledford, Hanson-Van Winkle-Munning Company, Chicago, Ill., is the District Supervisor for the Indianapolis and Louisville Branches in addition to those reported previously.

I. F. C. News

Planning for the Future

The Planning and Organization Committee of the International Fellowship Club met on April 21 in Hotel Statler, Buffalo, N. Y., President George L. Nankervis in the chair, to prepare an agenda for its meeting in Buffalo. This meeting, it is expected, will see a reorganization of the Club into a formal organization of suppliers to the plating and allied industries.

Each supplier is requested to send a responsible representative to the I. F. C. luncheon on Monday, July 30, and the executive session that will follow. This session is expected to last throughout the afternoon.

The group, among other things, is interested in promoting the finishing industry among the general public and has already taken over the publicity efforts initiated by the Public Relations Committee of the American Electroplaters' Society. It also generously supports this Society's Convention activities, as shown in the Convention program in this issue.

Washington Orders

(*Continued from page 704*)

Maintenance, repair and operation supplies.—A business firm, government agency or public or private institution making use of DO-97 ratings for procurement of MRO supplies need not make reports of quarterly quotas to NPA if it was in operation throughout the whole year 1950.

An amendment to NPA Regulation 4 dated May 22 permits the use of the DO-97 rating for up to 120 per cent of the amount spent on such MRO items during the base period. This increase from 100 to 120 per cent was authorized to make up for higher prices and increased use. Also, an organization that uses the DO-97 rating to get 20 per cent or less of its quota is now permitted to purchase an unlimited amount of MRO items without use of the rating, subject to other limitations in NPA orders, thus limiting the use of the DO-97 rating to scarce items. The amended regulation furthermore permits a choice of base period. The use of DO-97 for capital additions is limited to 10 per cent of the quarterly quota or $750, whichever is the higher. Quotas may be established for the whole company or for each of its plants. DO-97 may not be used to obtain material on lease.

Small Business.—Defense Production Administrator W. H. Harrison announced, on April 23, eight specific steps recommended by DPA in a drive to increase participation of small business in the defense program: (1) Contracting officers should require contractors to state in bid or negotiation whether or not additional facilities will be required, so that business can be channelled into existing facilities where available. (2) Each service should designate specific items suited for distribution among a number of contractors, and give advance notice, with adequate time for preparation of proposals, in the daily procurement synopsis issued by NPA. (3) Contracting officers should obtain agreement with suppliers to subcontract wherever possible. (4) Prime contractors should be provided with incentives to subcontract by allowing the same administrative and overhead costs, as well as profits, on subcontracted portions as on others. (5) The Department of Defense should authorize payment of such justifiable price differentials as required to utilize marginal producers and to pay transportation penalties. (6) The same department should increase the number of inspected and eligible contractors in its "M-Day Production Allocation Program". (7) All agencies should continue existing programs of technical aids, production services and contracting and subcontracting assistance to small business. (8) These agencies should undertake a coordinated program of information about methods of Federal procurement and encourage all businesses to publicize their needs for subcontractors and their subcontracting methods.

The difficulties encountered by small businesses have led 100 small manufacturing concerns in Omaha, Neb., to form a production pool for the purpose of speeding defense work through prime and subcontracts, according to announcement by NPA, which authorized its formation. Many such pools were in operation during World War II. Designated as Omaha Industries, Inc., the pool will be concerned only with defense work undertaken by its members, not with their regular commercial business. It is incorporated under the laws of Nebraska. Each member pays a membership fee, and membership is open to other concerns in the area. The members employ on an average about 53 persons. Other pools are in the process of formation in other States.

A 31-page guide book, Mobilization Guide for Small Business, was issued by NPA on May 17. It contains such information as how to be placed on Government bid lists; how to appeal for "hardship relief" from controls and regulations; how to get help in obtaining needed machinery and operating supplies.

Branch News

ADELAIDE BRANCH

A general meeting was held at the Adelaide Chemical & Fertilizer Company, Port Adelaide, on March 14.

Members were taken on a conducted tour of the sulfuric acid plant where sulfuric acid is manufactured by the chamber process. Great appreciation was shown by members for the supper served through the courtesy of the Company. A vote of thanks was proposed to the Company by Harold Havelock and was ably supported by J. Strugnell.

Attendance was 42.

W. Fischer, *Hon. Secretary*

BALTIMORE-WASHINGTON BRANCH

The April meeting was held at the National Bureau of Standards, Washington, D. C., on the 17th.

During the first 20 minutes, the Branch was treated to a Technicolor film, titled "America the Beautiful". This film, issued by the Bond Division of the U. S. Treasury Department, portrays the scenic beauties that are America, and was very well received by the members.

A "Meet the Press" type of discussion on plating questions followed. A panel of four, consisting of Dr. W. Blum, Charles Glock, Charles Ostrander, and Arthur Pierson, answered the "wing-dings" sent in by the members. Dr. Abner Brenner served as moderator and did an excellent job. Ken Huston carried away the prizes, having submitted the most questions (26), for which he earned $3.00, and having stumped the experts on one question, for which he received another dollar.

The meeting then adjourned to informal discussions and refreshments. Many felt that it was one of the most friendly and sociable meetings held for quite some time.

V. J. Hughes, Jr., *Secretary*

BRIDGEPORT BRANCH

The meeting on April 5 was held in the Electrolux Corporation, Inc., Auditorium, Old Greenwich, Conn. It was preceded by a fine steak dinner, served to 143 members and guests through the courtesy of the Corporation.

After George Morrow, Magician Extraordinary, had performed feats of magic with humorous comments, Librarian R. C. Barrett introduced Mr. Henry Strow of the MacDermid Company, Inc., Waterbury, Conn. In his talk on "Plating Under Defense Conditions", Mr. Strow discussed the present situation of Government restrictions of use of materials and the desire of manufacturers to use substitute materials to keep production of civilian goods going. In some instances it may be possible to zinc plate or copper plate some of the products instead of using nickel plate. In zinc plating impurities from the salts or anodes may cause trouble. (Copper will produce blisters and can be removed with zinc dust.) One cannot get a chromium finish on top of a copper plate that is comparable in luster to the finish over nickel plate. Racking is more important, higher current density must be used, and open holes and segments may not be covered with chromium without rack changes.

Mr. Milton Hodges, Plant Engineer of the Electrolux Corporation, hoped that the plant visitation, including the visit to the waste-treatment plant, would be of interest.

Mr. William Murray, Works Manager of the Electrolux Corporation, spoke of the amount of production that is run through the plant on vacuum cleaners and other products and of the improved methods and machinery that are being used.

Guides were then provided who took the guests through the plant. A grand meeting!

Joseph G. Sterling,
Secretary-Treasurer

CHICAGO BRANCH

Approximately 150 members and guests attended the Annual Ladies' Night on April 13 at the Western Society of Engineers Headquarters.

The meeting commenced with the usual social hour and dinner. Dr. Monaweck presided over his last formal meeting as President, and later turned his gavel over to the new and able President, Ray Ledford.

The principal business item of this meeting was the installation of the following new officers:

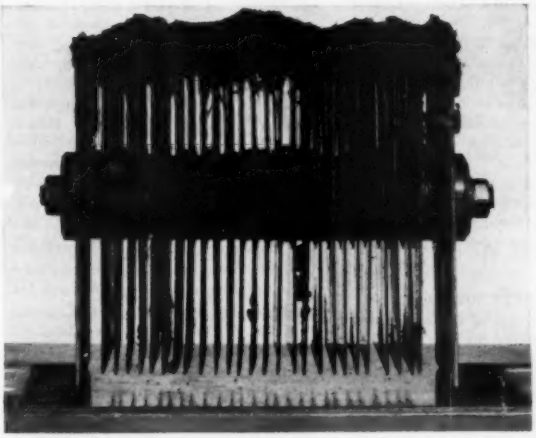
President—Ray Ledford
First Vice-President—Klem Petrosius
Second Vice-President—Elmer H. Olson
Librarian—J. M. Andrus
Secretary-Treasurer—Paul Glab

The speaker was Mr. Clarence Sample of The International Nickel Company, who discussed the performance characteristics of coatings which can be used as substitutes for nickel plating. Colored slides were shown of specimens having zinc, cadmium and lead coatings, which had been exposed to salt fog and cycled temperature-humidity and of similar specimens which had been exposed in industrial, rural and seacoast atmospheres. The superior performance of thin lead coatings in industrial atmospheres was contrasted with failures in rural and seacoast conditions. Slides were also shown of specimens in the recent A. S. T. M. atmospheric-exposure test of the copper-nickel-chromium coatings on high carbon steel. The results of these tests indicate that copper undercoatings add little to

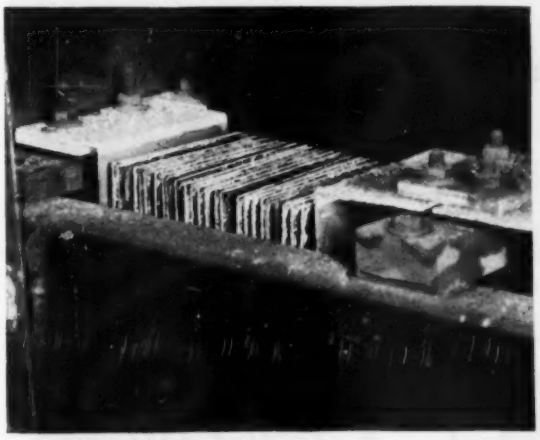
Looking for a Better Finish?
Try
HARRISON'S
4A
TAILOR-MADE
BUFFING AND POLISHING COMPOUNDS
for
Aluminum, Brass, Copper, Stainless Steel, Carbon Steel, etc.
EMERY CAKE, GREASE STICK
CEMENT AND THINNER
for setting up wheels, belts and rolls
HARRISON & COMPANY, Inc.
HAVERHILL, MASSACHUSETTS

FOR FURTHER INFORMATION, USE READER SERVICE CARD: INDICATE A 664.

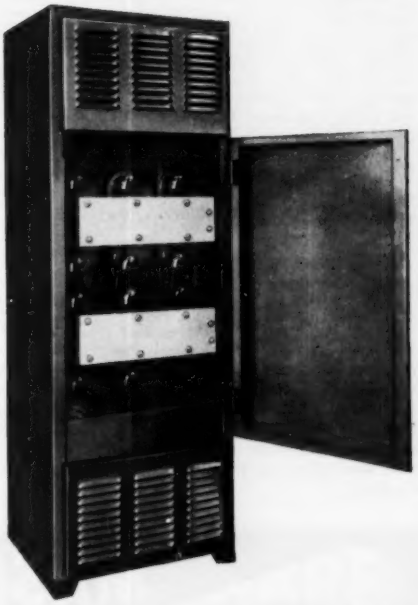
NOW LOCATE RECTIFIERS ANYWHERE without fear of CORROSION or DIRT



DIRT from sweeping and buffing operations has ruined this stack. The photo shows an unprotected stack removed from an ordinary plating rectifier which was in a poor location.



CORROSION damaged this stack which was placed too close to tanks. Fumes can impair open stacks in a short time if rectifier is improperly located.



G-E SELENIUM STACKS ARE SEALED IN OIL

Oil-immersed, hermetically sealed, G-E selenium rectifiers give you complete freedom of plating room layout. Place them anywhere, and forget about corrosion and dirt.

Stacks of G-E selenium rectifiers are factory sealed in oil-filled cans, with covers welded in place. Neoprene-sealed, glazed-porcelain terminals complete the seal—make sure that corrosion and dirt don't get in.

For real power savings investigate G-E rectifiers now. Contact the rectifier specialist at your local G-E office or write Section 464-6, *General Electric Company, Schenectady 5, N. Y.*

You can put your confidence in—

GENERAL ELECTRIC

464-6

Branch News

the protective value of the composite copper-nickel-chromium coating on steel, and what little they did add was important only in the early stages of deterioration or in the mildest corrosive atmospheres.

Drawings for door prizes for the ladies and refreshments climaxed one of the best technical-social events of the Branch's history. Following the formal meeting, an informal "get together" took place at which refreshments were served and plating problems forgotten as the ladies took over the conversation.

Plans have been evolved to expand the Branch's monthly bulletin. Under the editorship of PAUL GLAB and the able assistance of R. SCOTT MODJESKA, the bulletin is in good hands.

R. E. HARR
FLOYD H. MELLER

CHICAGO BRANCH

The officers were very pleasantly surprised at the large attendance, 150, at the meeting on May 11. They had anticipated the kind of enthusiasm children have for visiting the dentist. Their reason, a National officer was going to explain fiscal policy and the need for raising the dues.

It must be that our FIRST VICE-PRESIDENT CLEVE NIXON has that well-known painless method. There were some vigorous and pointed questions from the floor, but most were convinced that with some modifying restrictions an increase in dues was necessary.

The speaker for the educational session (not that Nixon wasn't educational) compensated for the business aspects of the program. He was MR. KIRKPATAICK of Frederic B. Stevens, Inc., who spoke about "Ventilation". Being of the rugged type the platers felt at home with him and at his invitation shot questions at him during his talk. His answers showed his wide experience and that he was well qualified, both from a theoretical and practical viewpoint, to answer them.

After the meeting had closed at 11:00 P. M., a large number of the members went down to the lounge to carry on the discussion over appropriate refreshments.

J. ANDRUS

CINCINNATI BRANCH

Despite the lateness of the season and the fact that platers do not ordinarily turn out to hear a talk about buffing, the Branch had a record attendance at its meeting on May 23. After a splendid dinner had been enjoyed by some 46 hungry members, the meeting began with 17 additional platers, polishers, and friends on hand.

PRESIDENT ROBERT MILLER reappointed the following Delegates to the Buffalo Convention: CHARLES T. NUZUM, ROBERT D. MILLER, and CHARLES W. PARKE or CARLTON CLAYBAUGH.

This year's picnic will be held on June 22 at Shady Shores, Ky., across the river from Cincinnati.

MR. W. L. MORGAN, of the J. C. MILLER Company, Grand Rapids, was the speaker on "Buffs". Following a short introduction dealing with early methods of polishing, Mr. Morgan stated that buff costs are affected by the condition of the castings, and pointed to the desirability of using the proper size grain in polishing operations, usually a finer size than is normally employed. The grease stick could be used to greater advantage. At least one variable-speed lathe should be available in the polishing department. The polisher should always push down on the last stroke, not pull up. He concluded with an explanation of the different grades of materials available for buffs, and the significance of having proper buff speeds.

MR. R. V. TWYNING, also of the J. C. Miller Company, discussed the development of liquid buffing compounds, their usage and application.

After the usual question period, the Branch enjoyed a social hour as the guest of the J. C. Miller Company.

CHARLES WISE, *Secretary*

DALLAS-FORT WORTH BRANCH

The monthly meeting in the Adolphus Hotel on April 26 had an attendance of 46.

PRESIDENT F. E. LANE introduced the guest speaker, MR. B. F. AMES, of Maas & Waldstein Company, Chicago, Ill. Mr. Ames gave a very interesting talk on organic finishes, and a lively discussion of various finishes followed. It was decided to hold the May meeting in Fort Worth.

C. A. WHITE, *Secretary*

DALLAS-FORT WORTH BRANCH

The Branch met on May 24 at the Cattlemen's Cafe, Fort Worth, for steak dinner and monthly meeting. SECOND VICE-PRESIDENT JOHN O'NEAL in the chair.

No business of the Society was discussed. ROBERT H. HEPPEL introduced MR. WILLIAM JACKSON, of The Udylite Corporation, Detroit, Mich., who gave a very interesting talk on "Barrel Plating". A lengthy discussion followed his presentation.

MR. R. H. EVANS of Fort Worth A. F. Procurement Field Office then gave a brief talk on "Quality Control".

C. A. WHITE, *Secretary*

DAYTON BRANCH

Our last regular meeting of the fiscal year was held on May 4 at the Engineers' Club.

The officers for the coming year were elected:

President—RALPH L. CLINEFELTER
First Vice-President—FRED BAUCH
Second Vice-President—RICHARD M. CLINEHENS
Secretary—PAUL E. GESKE
Treasurer—GORDON R. LYONS
Librarian—JOHN K. EASTON
Board of Managers—ELMER W. REHME, HERMAN E. AUSTEN, HOLLE LEUCHAUER

The following members will represent the Dayton Branch at the Convention in Buffalo: WALTER E. MOLINE, FRED BAUCH and WARREN E. ROBINSON, Delegates; L. A. CRITCHFIELD, ELMER W. REHME, and GORDON R. LYONS, alternates

There was no scheduled speaker for this meeting, instead several movie shorts were shown.

R. M. CLINEHENS,
Secretary

DETROIT BRANCH

The meeting on May 18, when DR. S. WERNICK presented DR. W. BLUM with the E. T. S. honorary membership (reported elsewhere in this issue) was the Branch's last monthly meeting until the first Friday in September.

On July 21 the Annual Stag Day will be held at the Forest Lake Country Club, and a large Detroit contingent will be at Buffalo for the Convention July 28.

E. STEEGAR,
Publicity Chairman

GRAND RAPIDS BRANCH

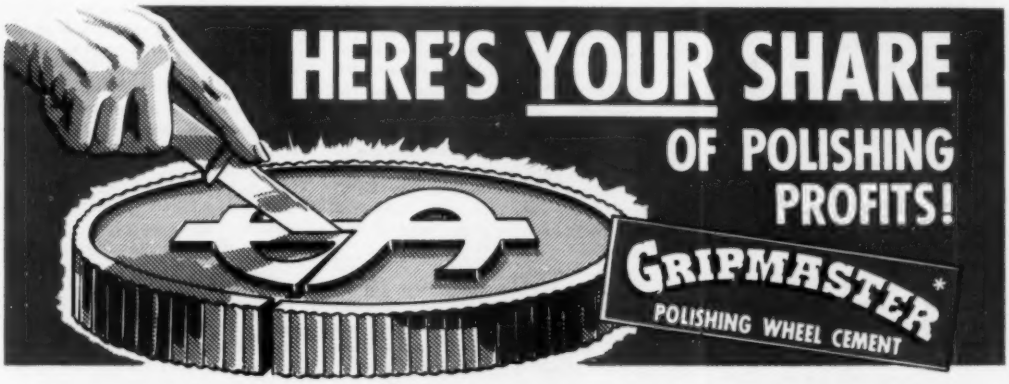
The final meeting of the season was held in the club rooms of the University Club on May 11. Following the Annual Steak Dinner, enjoyed by the members, the annual reports of the Past President and the Treasurer were received, and Delegates to the Convention were appointed.

Entertainment was provided by the "Chromatics" male quartette from Muskegon and by a red-hot and blue brass quartette, in which our own LYMAN SPEARY wields a wicked trombone. After-dinner refreshments were provided by the courtesy of "Dusty" Rhoades of the Northwest Chemical Company, while the members viewed the boxing match on television.

At a recent meeting, the following officers were elected to serve for the 1951-1952 season:

President—HAROLD L. GRUTTER
First Vice-President—JACK D. KERSHAW
Second Vice-President—C. SCHREUR
Secretary—KEITH E. YHOUSE
Treasurer—WALLACE L. REED
Librarian—EDWARD C. SOSNOWSKI
Assistant Librarian—FRANK A. BADALUCO
Board of Managers—F. J. DARLING, J. HAVILAND, D. H. SHANTZ

C. SCHREUR,
Publicity Manager



"First Choice of the World's Best Polishers"

- Grains of emery are locked in with *"VISE-TIGHT"* control.
- *SAVE MONEY* on complicated inventories of adhesives—*GRIPMASTER'S* one grade grips all grains—300 to 20.
- Less stops for wheel changes.
- Preferred by *POLISHERS* who take *PRIDE* in their work.

GRIPMASTER DIVISION
Nelson Chemicals Corporation
12345 Schaefer Highway, Detroit 27, Mich.
MAIL TODAY
IN CANADA: H. C. Nelson Chemicals Ltd., Windsor, Ontario

* REG. U. S. PAT. OFF

HAMILTON BRANCH

The final meeting for the 1950–1951 season took place on May 18.

The Branch was fortunate in having as its guest speaker, Mr. G. S. Mallett, Technical Supervisor for Anaconda Brass Company, Ltd., New Toronto, who spoke on "Aspects of Brass as Used in Industry". The speaker traced the history of copper from its discovery to its present-day uses, particularly in the manufacturing of brass. In discussing a large number of brass alloys, their composition, properties and uses, he expressed the opinion that there are too many of them. One alloy, he said, could easily substitute for two or three and do the job as well if not better. A lively discussion period followed.

A suggestion was put forward that the meeting might be changed from Friday to Thursday during the coming season. It was decided that a vote be taken on this question at a future date.

J. Harden, *Correspondent*

HARTFORD BRANCH

The meeting on May 21 was attended by 40 members and guests. The program consisted of a question-and-answer session, with Mr. George B. Hogaboom as moderator and Art Logozzo, Nutmeg Chrome Corporation; Emile Beloin, W. D. McDermid Chemical Company; Ralph McCahan, E. I. duPont de Nemours & Company; Ted Voyda, Apothecaries Hall Company; William Cullen, Stanley Works; and Harry Sanders, Enthone, Inc., as the experts.

The meeting turned out to be a classroom discussion on the many problems encountered in the metal-finishing industry, with most members taking an active part in the discussion. It was educational and highly informative.

Prizes were awarded to the winners of the paper contest held during the past year. William Cullen won the first prize, and honorable mention award went to Salvatore Santoro.

The Hartford Branch will close the season with an Annual Golf Party in June, at the Rockledge Country Club in West Hartford.

Refreshments were served through the courtesy of The Chemical Corporation.

Stanley Platoz, *Secretary*

INDIANAPOLIS BRANCH

The monthly meeting May 2, with 20 members present, was preceded by the usual steak dinner.

There was much discussion and many suggestions and criticisms of our Annual Educational Session and Dinner Dance held on Saturday, April 28. Almost all agreed that it was the best ever. Plans are already laid for next year's Dinner-Dance. Delegates were instructed regarding several important issues to be brought up at the Annual Convention.

The speaker was Mr. Bert Cer Vaas, owner of Home Plating Company. In his talk he related experiences from the two years he spent in South America and the four years in Far East as director of Military Intelligence during World War II. His talk was enjoyed by all, as the subject is of great interest at the present time, international affairs having much bearing on the plating industry and manufacturing as a whole.

The meeting adjourned with retiring President Claude Weekly turning over the gavel of office to the new President, Al Kriese.

Edw. Bruck, *Secretary*

LOS ANGELES BRANCH

The 21st Annual Educational Session and Dinner Dance was held on April 21 in the Rodger Young Auditorium. This was by far the most successful and best attended affair that the Branch has ever sponsored. Over 400 guests were present at the dinner, and the turnout for the technical session was exceptionally large.

Dr. R. B. Saltonstall, Technical Director of the Udylite Corporation, Detroit, Mich., addressed us on "Recent Trends and Developments in Electroplating". He stressed reduction of costs by labor-saving automatic equipment for both plating and polishing, and outlined methods of polishing strip stock before fabricating to reduce polishing costs and to save wear on dies and tools. Liquid polishing and buffing compounds in various applications are also aimed at reducing costs, as is tumbling prior to barrel plating of many small parts. Bright dipping and electropolishing of both basis metals and plated coatings, and the application of periodic current reversal also offer means of reducing costs and improving quality of electrodeposits. Studies of the effect of impurities on the physical quality of deposits promise to lead to the same goals. Dr. Saltonstall also outlined substitute methods and materials.

Mr. Hubert M. Goldman, Chemical Engineer, Enthone, Inc., New Haven, Conn., gave a very complete discussion of "Chemical Conversion Coatings and Oxide Finishes". His paper covered coating procedures and practices on almost all metals, electrolytic and chemical: oxide coatings on aluminum, steel, etc.; sulfide coatings to produce specific effects; phosphate coatings on zinc, cadmium, and aluminum.

Mr. William Vargo of Smith-Davis Company presented a paper prepared by Dr. G. Klinkenstein, President of Maas and Waldstein Company, Newark, N. J., on "Substitute Organic Finishes for Electroplated Coatings". Chief among substitutions in the decorative field is bright-dipped electroplated zinc. Further protection to maintain the luster may be obtained by the use of clear organic coating materials. These may be of an air-drying type, or of the baked synthetic class for still greater permanence. Light deposits of nickel or chromium are also improved with organic finishes. Water-dip lacquers keep clean parts clean, particularly where one finishing operation is done in one plant and a subsequent operation in another. They will also eliminate finger printing on plated ware. Recently developed clear organic coatings have excellent resistance to salt spray, weatherometer tests, hot-and-cold-cycle tests, and water-immersion tests. Thick organic coatings are difficult to cure, and one must resort to multiple coatings and multiple bakings. Very thin coatings exhibit porosity and provide insufficient corrosion protection

Two Branch members, Mr. Morton Schwartz, of Surface Alloys Corporation, retiring Librarian, and Mr. Earl Arnold, of the L. H. Butcher Company, present Librarian, presented jointly the last paper, on "Military Applications of Electroplating". Mr. Schwartz discussed acid plating solutions and anodic acid cleaning; copper and iron for electroforming and salvage; chromium for wear resistance; porous chromium for improved lubrication; lead for bearings and corrosion protection; and nickel for salvage, corrosion resistance, wear resistance, and electroforming. Nickel deposits, tailor-made with respect to hardness, crystal structure and other features may be had by very close control of bath constituents and operating conditions. Mr. Arnold covered the alkaline solutions: copper for carburizing stop-off and antigalling; zinc, tin, and cadmium for corrosion protection and as aids in soldering; tin for nitric stop-off; silver for bearings, television and radar parts; silver and gold for electronic equipment. He also outlined immersion processes for producing thin coatings of various metals.

Considerable discussion was evoked by the papers, indicative of the interest with which they were received.

G. Stuart Krentel, *Secretary*

LOS ANGELES BRANCH

The Branch seems to have been running pretty substantially to alumni of Michigan State College, with several of our last few speakers being graduates of that institution: Dr. Richard B. Saltonstall, Mr. Gilbert Extale, Mr. G. S. Krentel, and, at the May 9 meeting, Mr. Stanley S. Krentel, Detroit Manager of MacDermid, Incorporated. He gave the 65 members and 9 guests present an informal and very interesting picture of several of the full-automatic electrofinishing operations in and around the Detroit area.

In his discussion of cleaning of steel, he indicated the need for a double cleaning cycle for heavily contaminated and/or welded pieces. Solvent degreasing is required on parts which are folded in forming. Warm-water rinsing improves rinsing following high-concentration alkali

cleaners, and headers for spray rinsing over the rinse tank eliminate cleaner sticking to the work. A high degree of buffing is the best initial preparation for chromium plating of stainless steel for a color match. Due to the relatively high electrical resistance of stainless steel, it is advisable to have more rack contacts than for other types of work.—The choice of cleaning cycles for zinc-base diecastings is closely related to the buffing compounds and the buffing methods used. If pre-cleaning by emulsion-type cleaners is used, the big problem in subsequent operations is to remove the emulsion cleaner from the racks by adequate pressure spray washing. Pressure emulsion washing is also an excellent pre-cleaning method.

Mr. Krentel also discussed the copper-chromium type of deposit, which has not been used to any extent in this area. It requires different handling from the usual nickel-chromium plating. One is extreme care in coloring the copper deposit to prevent lap marks from showing through the chromium. Another is that the copper plated parts, before and after buffing, must be handled more carefully than nickel plated parts. It is more difficult to clean for bright copper than for bright nickel, especially in the case of large items. Periodic reverse current is an aid in eliminating the haze that sometimes occurs, particularly on heavy deposits and large flat areas. The chromium plating solution should be operated at a low temperature and adjusted to the highest throwing power possible, and in extreme cases it may be necessary to have cathodic contact on the work as it is entering the tank to prevent greyness. A clear synthetic lacquer may be used for further protection. If buffing of the chromium deposit is required, it should be cleaned before lacquering, and it is sometimes helpful to use a dilute chromic acid rinse before drying for better lacquer adhesion.

One new member was received. Don Bedwell reported on the Annual Affair. Walter Behlendorf announced that 395 tickets were sold for the dinner-dance and that 126 attended the noon luncheon.

G. Stuart Krentel,
Secretary

MELBOURNE BRANCH

Sixty-seven members and visitors attended the 60th regular meeting on April 19.

The meeting took the form of an open discussion on "Nickel Conservation", which was divided into four sections.

1. The Availability of Nickel.—Committeeman Glen Walker, in introducing this section of the discussion, stated that to the best of his knowledge, no Melbourne plating shop had shut down because of the shortage of nickel, and that in his opinion sufficient nickel is being received to keep every shop operating at a reasonable rate, if sufficient care is taken in operation.

2. Effects of Shortages on Specification Plating.—Jim Anderson of General Motors Holden's, Ltd., introduced this section with the statement that his firm would rather cut out plating altogether than reduce the standard of the work. Plating exactly to specification and keeping nickel from irrelevant surfaces have saved his firm's Adelaide plant as much as 30 per cent of its total nickel consumption. When the use of thicker copper undercoats was suggested, he agreed that this type of coating will usually stand up very well in salt-spray tests.

3. Methods of Nickel Conservation.—Committeeman Harold Meaton, in recommending methods which he had used to save as much as 50 lb nickel in a week, stressed that nickel often plates thickly onto suspension wires, that areas should be accurately calculated, that close control of bath conditions is needed, and that large savings can be effected by the use of a drag-out tank.

4. Alternative Coatings.—Committeeman John Dale dealt with the relative merits of zinc, cadmium, chromium, lead, tin, copper, cobalt, tin-nickel, and various alternative coatings underneath chromium, such as copper, zinc, cadmium. He summed up by stating that nickel is definitely preferred to any of these as a basis for chromium. There was considerable discussion on the merits of chromium applied from a cold solution over a zinc coating.

The meeting was concluded by President Bob Taylor thanking all who had contributed to the discussion.

Rowland H. Keller,
Honorary Secretary

MELBOURNE BRANCH

The 61st regular meeting of the Branch

MAGNUSON PRODUCTS CORPORATION
50 COURT STREET
BROOKLYN 2, NEW YORK
INDUSTRIAL CLEANING COMPOUNDS
GREETINGS
to all
Conventionites
at
Buffalo - 1951
At this convention there will be meetings and discussions relative to the electroplating industry that will be of high value and provide sound technical information which will aid largely toward solving many problems that may arise in the years ahead.
We are always glad to discuss metal cleaning difficulties and help toward solving them. If you have such problems, write us, or call for one of our representatives.
MAGNUSON
PRODUCTS
CORPORATION

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 668.

was held on May 17 with 55 members and visitors present.

PRESIDENT BOB TAYLOR reported on the Third Annual Ball, held at the Dorchester, and thanked all who had helped to make the evening a success. People interested in all types of plating were represented among the 200 who attended. The function was greatly enlivened by the donation of two nickel anodes. One was sold to raise funds, the other presented as a prize for the most humorous effort by a plater performing the lady's part of a circular waltz. The show put on by GEORGE GATENS was selected as supreme among those of the many platers who waltzed as if their lives depended on their getting hold of that anode.

JIM ANDERSON, in introducing the speaker, SIR HERBERT W. GEPP, gave a special welcome to LADY GEPP and to the other ladies present. Sir Herbert spoke on "Some Notes on the Development of Electrolytic Zinc Production in Australia". It was 1915, while Sir Herbert was in America, that he first became interested in electrolytic zinc, and he outlined the many difficulties encountered in pilot plants at Anaconda and at Bulli Hill, near San Francisco, in those early days. He explained the recovery process as it was developed there, and then gave details of the setting up of the plant at Risdon, Tasmania, which now produces 250 tons of zinc per day.

One of the most unusual problems encountered was that borers in the wood lining of the tanks burrowing through the inner lead coating, were killed by the acid solution, but left holes which caused the tanks to leak. This was so serious that 400 of the 6 x 4 x 4-foot tanks had to be stripped to their lining, and treated to kill the borers. Other problems were the disintegration of lead anodes due to chloride build up, tracing and elimination of cobalt in the solution (9 ppm were found to be deleterious), and bottoms falling out of the 70-ton molten-zinc-storage vat.

CLIVE DALGLEISH thanked Sir Herbert for one of the best lectures presented to the Branch.

ROWLAND H. KELLER,
Honorary Secretary

MILWAUKEE BRANCH

More than 80 members and guests attended the 418th regular meeting of the Branch on April 6.

The Nominating Committee, DEXTER RHODES, SI BEVINS, and ROBERT TOEPPE, assisted by several other members of the Branch, offered a slate of officers to be voted upon at the May 11 meeting.

A vigorous discussion of the proposal to raise the Branch membership dues followed the reading of letters from other Branches on the subject. PRESIDENT L. DIVELEY requested WILLIAM GEISSMAN to visit the Chicago Branch on May 11 and report on what A. E. S. FIRST VICE-PRESIDENT C. F. NIXON will propose.

Five applicants were elected to membership. Delegates to the National Convention at Buffalo are ROBERT STEUERNAGEL, P. RITZENTHALER and E. E. PIELLUSCH; alternates are L. DIVELEY, A. NOEL and L. J. MOYES.

MR. J. B. WINTERS, Research Chemist of R. O. Hull and Company, Inc., discussed the subject of "Hydrogen Embrittlement", and, with the aid of drawings and slides, demonstrated how steel absorbs this gas. He spoke of the gigantic pressures developed by the hydrogen trapped in the cavities of the metal and of methods of reducing embrittlement. Many questions on specific problems indicated that platers have a great interest in the subject.

The door prize, an electric mixer, donated by the John Oster Manufacturing Company, was won by JUEL SEVERSON. Refreshments were served through the courtesy of MR. S. STROINSKI of the An-Kor Rack Company and MR. E. ROBINSON of the Milwaukee Branch.

E. E. PIELLUSCH, *Secretary-Treasurer*

MILWAUKEE BRANCH

The Branch, at its regular meeting on May 11, elected the following officers:

President—EVERETT ROBINSON
First Vice-President—KENNETH OLSEN
Second Vice-President—HERMAN BAAUN
Librarian—GENE BOSL
Secretary-Treasurer—E. E. PIELLUSCH
Board of Managers—V. MATTACOTTI

TED HARTSHORN gave a preliminary report on the very successful and well attended Educational Session and Banquet, when we were honored to have A. E. S. PRESIDENT W. J. NEILL address us. VINCENT MATTACOTTI, GLEN SCHWEMER, ROBERT STEUERNAGEL and their committees were congratulated for their splendid job in preparing the excellent program.

ROBERT TOEPPE, Chairman for the Racine meeting, announced that Dania Hall has been reserved for September 7. Plans are being made for another excellent party.

Our guest speaker, MR. R. SCOTT MODJESKA, President of Scientific Control Laboratories in Chicago, gave an excellent talk on the "Finishing of Stainless Steel". He discussed solutions for electropolishing and plating on stainless steel, and explained the functions of the components of each bath. In plating, the resistance of these alloys make it necessary to employ multiple contacts, and in electropolishing, conforming anodes are required.

E. E. PIELLUSCH, *Secretary-Treasurer*

NEWARK BRANCH

Seventy members and guests attended the regular meeting on April 20, which began with a showing of a movie on baseball, as the Yankee Ball Club does it.

ROBERT EHRHARDT was appointed by PRESIDENT FRANK ENGLAND to head the newly created Membership Committee.

WILLIAM DEVOTI and THOMAS HADDOW were elected to honorary membership of the Branch.

In the absence of LIBRARIAN ROBERT HORROCKS, SERGEANT-AT-ARMS THOMAS AUSTIN took charge of the educational session, in which two leaders in the field of barrel finishing gave their experiences. The first speaker was MR. G. W. OAKES, of the Hartford Steel Ball Company, who outlined briefly the types of barrels in common use today, the factors involved in tumbling, the media from which the finisher may choose, speeds attained in the larger barrels, and preferred barrel linings. A few procedures for burnishing of small parts were given. The second speaker was MR. LEVEANE VEAZIEA, of the Roberts Rouge Company, who confined his talk to some of the tricks used by burnishers to get the maximum results in the minimum amount of time. He pointed to some experimental work in tumbling large parts and parts of complicated shapes in other types of barrels than the conventional hexagonal barrel.

Both speakers gave interesting accounts of their specialties and helpful answers to the numerous questions asked by members of the audience.

GEORGE WAGNER reported that HORACE SMITH is convalescing nicely from his recent illness.

Refreshments of cheese, crackers and beer were provided after the termination of the meeting.

S. S. FREY, *Recording Secretary*

NEW YORK BRANCH

During the month of May, the Branch held two meetings. The first, on May 11, was highlighted by a talk by DR. S. WERNICK of England, who discussed new developments in metal finishing in his country. Among them was an automatic current-density regulator and a nickel-tin alloy which may be plated directly from a solution at fairly high current densities and efficiencies. Dr. Wernick then showed a film on the "Roto Dip" process by which automobiles are rotated on a spit through various tanks and spray chambers to clean, phosphate coat, and apply a coat of primer to all surfaces of the car.

At the second meeting, on May 25, eight new members were received. MR. AMATORE gave a final financial report on the Branch Banquet which was held on February 17. The business meeting was followed by a very enlightening talk by DR. ABNER BRENNER, of the National Bureau of Standards, who spoke about the properties of electrodeposited metals. This talk, accompanied by slides, went into such things as crystal structure and how it is changed by heat treatment. Dr. Brenner illustrated his talk by a great number of samples which were passed around to the membership. After a

lengthy discussion period, the meeting was adjourned.

PETER L. VEIT, *Recording Secretary*

CORRECTION

The New York Branch speaker on February 9 was MR. LEVERNE VERZIER, Vice-President of The Roberts Rouge Company, Stratford, Conn. MR. T. F. ONKEY is President of the Company. We regret the error in the May issue.—EDITOR.

PHILADELPHIA BRANCH

The regular April meeting held at Mosebach's Restaurant on April 27 was preceded by a dinner, attended by about 50 members and guests.

DR. HAROLD J. READ, of Pennsylvania State College, spoke on "Metallurgical Aspects of the Corrosion and Protection of Metallic Surfaces". The major categories of corrosion phenomena were described as reactions of a metal with (1) a gaseous atmosphere, (2) an alkaline solution (aluminum in sodium hydroxide), (3) a strong acid solution (zinc in hydrochloric acid), (4) a substantially neutral solution with a *p*H of from 5.0 to 8.0 (copper in sea water). All reactions within the latter category require the presence of oxygen; they are the most common and the most difficult to control.

Simple experiments to demonstrate that oxygen must be present to obtain this type of corrosion were described, and it was shown that corrosion takes place at the point farthest removed from the oxygen supply.

As an example of how corrosion of dissimilar metals in contact takes place contrary to what may be expected from their respective positions in the electromotive series, Dr. Read cited the corrosion of copper in cracked nickel-copper coatings. He had shown experimentally that copper under nickel was of no value for corrosion protection. He also explained the concentration of corrosion in the pores of metal coatings and discussed the mechanism of corrosion of stressed deposits. The considerable discussion that followed dwelt primarily on the present-day problems of obtaining suitable protective coatings in view of the shortage of critical plating metals.

MR. EUGENE ZURBACH, JR., followed with a short talk on "Practical Brass Plating". A new bath should contain 4 oz/gal copper, 1 oz/gal zinc, 2.3 oz/gal free cyanide, and have a *p*H of 10.2 (reduced from about 11.0 with sodium bicarbonate). The bath will tolerate carbonate build-up to about 18 oz/gal, at which time it should be discarded. Ammonia, as well as arsenic in very small amounts, is useful as a brightener. He cautioned that the same procedure for the analysis of free cyanide must be followed at all times.

A short business meeting followed, which admitted four new active members. A regular business meeting of the officers and committees would be held on May 8. JACOB TUCKER won the Ronson lighter door prize donated by MR. CHARLES WILMORE of Matchless Metal Polish Company.

I. WM. MARCOVITCH, *Secretary*

From the March meeting of the Rochester Branch when B. F. Ames, General Sales Manager of Maas & Waldstein Company, spoke about use of organic finishing instead of plating. Left to right: W. C. Treadwell, M. & W. Service Engineer; John Duford, Eastman Kodak; Mr. Ames, Joseph Hull, Eastman Kodak; Walter F. Swanton, Pfaudler Company; R. Flint, Ritter Company; W. Howard, Bausch & Lomb

ROCHESTER BRANCH

The Annual Meeting was held on May 22 at the Rochester Turnverein. Members were entertained with a buffet supper and beer before the meeting and with grandstand seats for a ball game at the Red Wing Stadium after the meeting. Needless to say, the meeting was well attended.

The election of officers for the coming year was the principal item of business and resulted in the following:

President—RAYMOND J. BERGHOLD
First Vice-President—JOHN R. LENZI
Second Vice-President—DONALD C. BLUM
Secretary—CHARLES B. FIDEOR
Treasurer—VERNON C. SCHAEFFEL
Librarian—JOHN Q. ADAMS
Assistant Librarian—EDWIN M. WALLIN
Board of Managers—JOHN M. DUFORD, ROBERT L. FLINT, JOSEPH W. HULL, FRED WAGNER, WILLIAM TREADWELL

Following the election, a lively discussion of the general welfare of the Branch revealed considerable enthusiasm on the part of a number of members for promoting a revival of interest and increased attendance next year.

WALTER F. SWANTON, *Secretary*

SAGINAW VALLEY BRANCH

Forty-six members and guests attended the meeting on April 11 in Zehnder's Hotel, Frankenmuth.

The guest speaker was MR. H. LEEVER, President of MacDermid, Western, Inc., who spoke about "Copper Plating", including impurities encountered in cyanide-copper baths and the treatment for their removal. A question-and-answer period followed.

Two educational movies were shown. The door prize was furnished by MR. HAROLD GRAY from Jackson Buff Company.

The officers for the coming year are as follows:

President—WARNER E. REMINGTON
First Vice-President—LOU J. MIMBIOLE, JR.
Second Vice-President—MANUEL BEN
Secretary-Treasurer—HARLAN L. DULEY
Recording Secretary—ELDON A. BRISSON
Librarian—GEORGE CARTER
Board of Managers—ALFRED KNIGHT, JOHN NOTMAN, JOHN W. LEE, DUANE FAULMAN, WILLIAM SNYDER
Delegates—L. D. FAULMAN, MELVIN TIPPMAN, JOE H. FARMER
Alternates—DANIEL P. WAITS, ROBERT A. NYQUIST, ALFRED KNIGHT

ELDON A. BRISSON,
Recording Secretary

SAGINAW VALLEY BRANCH

The meeting held on May 9 in the Colonial Room of Zehnders Hotel, Frankenmuth, Mich., had an attendance of 51 members and guests.

It was opened by PRESIDENT WARNER REMINGTON. LIBRARIAN GEORGE H. CARTER introduced DR. BERNHARD MARTIN, of McGean Chemical Company, Cleveland, Ohio, as the guest speaker. Dr. Martin described the "Chemistry of Purification of Nickel Plating Solutions" and also dealt with the fundamentals of thin nickel plate.

The door prize, furnished by Mr. William Hopkins, also of McGean, was won by Joe Farmer. Two educational movies were shown following a delicious dinner.

Clark George was named chairman of the arrangement committee for the Stag Party. Four new members were accepted into the society.

Eldon A. Brisson,
Recording Secretary

ST. JOSEPH VALLEY BRANCH

The regular monthly meeting on May 2 was Ladies' Night. A total of 46 members and their ladies enjoyed the dinner in the Empire Room of Hotel Elkhart, and 50 attended the technical session.

One applicant was elected to membership, and there was one in-transfer from and one out-transfer to the Grand Rapids Branch. Dr. Harold J. Wiesner was elected Delegate to replace Gene Roth.

Dr. Wilhelm introduced Mr. F. K. Smith, of Technique, Inc., as the guest speaker. The topic of his talk was "Jewelry". After having given a brief history of jewelry from the stone age to the present time, Mr. Smith explained the terms used in the jewelry trade relative to rolled gold, gold filled, and plated gold, and told of the significance of the marking on jewelry, including the karat. The technical description of the processes used in the finishing of jewelry included various baths for different colors and shades of gold and silver. There is absolutely no finishing of parts after they leave the last plating bath, and rejects after plating are completely reworked. The last operation before packaging is the rinsing of the parts in deionized water and drying by blow-off with high-velocity air.

An interesting discussion period followed which brought out several points of interest: Eighty per cent of all jewelry is made in Providence, R. I. area, where one plant alone employs over 3,000 in the manufacture of jewelry items. Even 25-69-cent jewelry is now gold plated, because gold plating can be done for as little as 8 cents per sq ft.

Dr. Wiesner expressed his appreciation to all the officers for their work during the past year. He then introduced the new officers and presented Dr. Ernest J. Wilhelm with the President's gavel. In acknowledgment, Dr. Wilhelm thanked Dr. Wiesner on behalf of the membership for his work. He also solicited suggestions for the conduct and operation of the Branch for the coming year from all members.

John Bayman, who was in charge of the entertainment, provided corsages for all ladies present. He introduced Mr. Clinton Milliken, magician of some fame in this area, who gave an interesting and delightful demonstration of his trade.

Eugene Roth, *Secretary-Treasurer*

SOUTHEASTERN BRANCH

The regular monthly meeting was held on April 13 in the Georgia Tech dining hall with 18 members present.

Nomination and election of officers for the coming year followed the usual supper. The following members were elected:

President—Wm. T. Weymouth
First Vice-President—Geo. W. Taylor
Second Vice-President—Claud J. Nally
Secretary-Treasurer—Dr. Fred W. Cox, Jr.
Librarian—E. P. Cofield
Board of Managers—M. E. Awtrey (1-year term), H. R. Stogner (2-year term), E. J. Slemons (3-year term)

It was decided that the retiring president would automatically become the 3-year member of the Board without election, to keep two experienced men on the board at all times.

The raising of the per capita tax from $4.70 to $7.50 suggested by the Boston Branch was discussed. The Branch instructed its Delegates to vote against it at the coming Convention, because it would only force us to raise our dues, which we do not care to do at the present time. Our Delegates for this year are: Dr. Fred W. Cox, Dudley Smith, and H. R. Stogner

Our speaker of the evening was Dr. Winters, of the Tennessee Corporation. He gave a good talk that was enjoyed by all.

Wm. T. Weymouth,
Secretary-Treasurer

SOUTHEASTERN BRANCH

The regular meeting on May 11 in the Georgia Tech Dining Hall had an attendance of 14 members.

The new officers for the 1951–1952 year were installed:

President—W. T. Weymouth, Atlanta, Ga.

"BUCKY" Says....
for best results you can't beat
BUCKINGHAM
POLISHING AND BUFFING COMPOSITIONS

Meet Present Production Demands With These Quality BUCKINGHAM PRODUCTS

- BURRING COMPOUNDS
- EMERY CAKE
- GREASELESS COMPOSITION
- EMERY PASTE
- STEEL CUTTING COMPOSITION

Representation in Major Cities

Write Dep't B for Samples

The BUCKINGHAM PRODUCTS Co.
14100 FULLERTON AVE. • DETROIT 27, MICH.

FOR FURTHER INFORMATION, USE READER SERVICE CARD; INDICATE A 669.

First Vice-President—GEORGE W. TAYLOR, Jacksonville, Fla.
Second Vice-President—CLAUDE NALLEY, College Park, Ga.
Secretary-Treasurer—FRED W. COX, JR., Atlanta, Ga.
Librarian—E. F. COFIELD, Atlanta, Ga.
Board of Managers—M. E. AWTREY, H. R. STOGNER, E. J. SLEMONS, all of Atlanta, Ga.

The retiring president, E. J. SLEMONS, was awarded a lapel pin in recognition of his services to the organization.

It was decided that meetings outside of Atlanta could be held upon the request of the members in that city and with 60 days prior approval by the President and the majority attending any Branch meeting.

The President appointed a committee to draw up and present within 90 days to the Branch for its approval a set of by-laws to govern future actions. Members are: MESSRS. HOLLAND, STOGNER, ROSENBERG, PRESIDENT WEYMOUTH and SECRETARY COX.

MR. SLEMONS suggested that a history of the Branch be drawn up within the next year. MR. AWTREY suggested a co-operative program to obtain new members. There was considerable discussion and pledges of cooperation by MESSRS. STOGNER, GRIFFIN, ROSENBERG, and WEYMOUTH. Mr. Weymouth suggested an educational meeting with several outside speakers. Means of raising the necessary money were suggested: a raffle, underwriting by members' companies, and a registration fee. This is to be discussed further at the June meeting.

The speaker of the evening was MR. EUGENE COFIELD, Chief Chemical Engineer of the Scripto Company. He gave a very interesting talk on plating at Scripto.

FRED W. COX, JR.,
Secretary-Treasurer

SYDNEY BRANCH

The 71st regular meeting of the Branch was held on April 12.

The lecture was in the form of a "Brains Trust", consisting of three well-known members, MESSRS. ARMSTRONG, BELLENGER and WILSON.

The questions asked by members were of a high standard and concerned a variety of very practical problems. They were answered aptly by our "Brains Trust", and as is usual in these sessions, time expired too quickly.

W. W. PATERSON, *Secretary-Treasurer*

SYDNEY BRANCH

The 72nd regular meeting took place on May 10. Inasmuch as we were unable to obtain a lecturer for the evening, the writer offered his services and gave a short talk on some job-shop practices, which was fairly well received by those present.

W. W. PATERSON,
Secretary-Treasurer

SYRACUSE BRANCH

Thirty-one members were present at the meeting on April 16.

The speaker of the evening was DR. C. W. MACMULLEN, Technical Director, Cowles Chemical Company, Syracuse, N. Y., and Cleveland, Ohio. Dr. MacMullen spoke on the "Essentials of Cleaners" and explained the functions of the various chemicals required to make up a cleaning compound. The presentation proved to be very interesting, as did the question-and-answer period that followed:

The officers-elect were installed, and Henry C. Holbert took over the duties as president from Ted Duvall.

A moving picture, "The Story of the Old Oaken Barrel" was shown through the courtesy of Hiram Walker Distilleries.

LINDLEY S. WOOD,
Secretary

SYRACUSE BRANCH

The May meeting was held on the 21st at the Loyal Order of Moose, an alternative meeting place that might be more suitable to our means. A full course steak dinner was served some 26 members, and 34 members attended the meeting that followed.

MR. CLIFFORD STRUYK, Engineer with General Chemical Division of Allied Chemical & Dye Corporation, spoke about "Plating from Fluoborate Solutions". The talk was supplemented with slides and a question-and-answer period. The topic was very timely and provided the members with interesting information.

A moving picture, "Cresta Blanca", shown through the courtesy of CVA Corporation, and door prizes of premium wine provided the members with pre-meeting entertainment.

LINDLEY S. WOOD,
Secretary

TORONTO BRANCH

The regular monthly meeting of the Branch was held on April 13 in the Royal York Hotel.

One of our members, MR. KERGAN WELLS, of W. W. Wells, Ltd., Toronto, was speaker for the evening. Mr. Wells is also a past president of the Branch and is an active member of our Research Finance Committee. Mr. Wells' subject was "From Glue Brush to Colour Buff", an interesting subject to all platers, as was shown by the attendance. It was a good straight-forward talk that covered all the aspects of polishing and buffing, both from a technical and practical standpoint, and yet spoken in a language that everybody could understand.

Final preparations for the Educational Session and Banquet to be held in Niagara Falls, Ontario, on May 12 were discussed. It promises to be the best one yet.

A. L. COXHEAD,
Correspondent

Why You Get Longer Service Life From

PYROFLEX EQUIPMENT

The workmen above are heat-bonding PYROFLEX thermoplastic corrosion-proof sheet lining to the steel shell of a pickling tank. The mason (below) is setting the first of two courses of acid-proof brick in KNIGHT acid-proof cement over the sheet lining. The finished unit will be fully corrosion-proof to any type or combination of corrosives for which it was designed.

Many different types of linings and construction are used in PYROFLEX Constructed Units depending on type of service. Each unit is designed to meet the needs of the individual situation. PYROFLEX Constructions include:

Acid Tanks
Fume Ducts
Brick Floors
Rinse Tanks
Acid Sewers
Plating Tanks
Pickling Tanks
Fume Scrubbers
Neutralizing Basins

Write for Bulletin No. 2-J PYROFLEX Construction.

MAURICE A. KNIGHT
Kelly Ave., Akron 9, Ohio
Acid and Alkali-proof Chemical Equipment

INDICATE # 670.

Directory of A. E. S. Officers and Research Chairman
Branch Secretaries and Research Chairmen

A. E. S. Directory

A. E. S. OFFICERS

President.....W. J. NEILL
Columbus Metal Products, Inc.
1341 Norton Avenue, Columbus 12, Ohio

First Vice-President.....C. F. NIXON
Ternstedt Division, G. M. C.
6307 W. Fort Street, Detroit 9, Mich.

Second Vice-President.....F. J. MacSTOKER
Farrand Optical Company, Inc.
4401 Bronx Boulevard, Bronx, N. Y.

Third Vice-President.....DR. G. P. SWIFT
53 Galen Street, Watertown 72, Mass.

Past President.....A. W. LOGOZZO
Nutmeg Chrome Corporation
79 Chapel Street, Hartford 3, Conn.

Executive Secretary.....DR. A. K. GRAHAM
P. O. Box 168, Jenkintown, Pa.

A. E. S. RESEARCH COMMITTEE

Chairman.....DR. W. A. WESLEY
The International Nickel Co., Inc., Bayonne, N. J.

Secretary.....The Executive Secretary

ADELAIDE, AUSTRALIA meets second Wednesday of each month. Address G.P.O. Box 598E, Adelaide, S. A., Australia.

ALLENTOWN-READING meets third Wednesday of each month in Spurgeon's Hotel, Allentown, Pa. Secretary-Treasurer, Mrs. Pearl T. Treisbach, 610 Allen Street, Allentown, Pa. Research Finance Committee Chairman, William R. Pfeiffer, Jr., 975 Green Street, Allentown, Pa.

BALTIMORE-WASHINGTON meets second Tuesday of each month with meetings in Baltimore at the Engineers' Club and in Washington, D. C., at the National Bureau of Standards. Secretary, Vincen J. Hughes, Jr., Hughes Chemical Supply Company, 1411 Fleet Street, Baltimore 31, Md.

BOSTON meets first Thursday of each month in Hotel Statler. Secretary, Dr. George P. Swift, 53 Galen Street, Watertown 72, Mass. Research Finance Committee Chairman, Eugene P. Carter, c/o United Carr Fastener Corporation, 81 Ames Street, Cambridge, Mass.

BRIDGEPORT meets second Friday of each month in Barnum Hotel. Secretary-Treasurer, Joseph G. Sterling, 134 Colony Street, Bridgeport 8, Conn. Research Finance Committee Chairman, Carl Schaefer, c/o Casco Products Corporation, 512 Hancock Avenue, Bridgeport 5, Conn.

BUFFALO meets first Friday of each month in Markeen Hotel. Secretary and Research Finance Committee Chairman, B. P. Fortin, Jr., 209 Forest Drive, Orchard Park, N. Y.

CHICAGO meets second Friday of each month at 8 P. M. at Western Society of Engineers, 84 E. Randolph Street. Secretary-Treasurer, Paul Glab, 882 N. Paulina Street, Chicago, Ill. Research Finance Committee Chairman, William B. Johnson, c/o Industrial Filter & Pump Manufacturing Company, 5914 Ogden Avenue, Chicago 50, Ill.

CINCINNATI meets fourth Wednesday of each month at 8 P. M. in Engineering Society Headquarters, McMillan Street and Woodburn Avenue. Secretary, Charles Wise, c/o The Buckeye Products Company, 7020 Vine Street, Cincinnati 16, Ohio.

CLEVELAND meets first Friday of each month in Cleveland Hotel at 8 P. M. Secretary-Treasurer, Harry Pochapsky, 24961 Euclid Avenue, Euclid 17, Ohio. Research Finance Committee Chairman, Howard A. Blouch, 12901 Elmwood Avenue, Cleveland 11, Ohio.

COLUMBUS meets first Friday of each month at 8 P. M. in Battelle Memorial Institute Auditorium. Secretary-Treasurer, Nathan L. Koslin, 2641 Cleveland Avenue, Columbus 11, Ohio. Research Finance Committee Chairman, Fred Brune, R. D. 7, Marion, Ohio.

DALLAS-FORT WORTH. Secretary, C. A. White, 4036 Commerce Street, Dallas 1, Texas.

DAYTON meets first Friday of each month in Engineers Club. Secretary, Paul E. Geske, 41 S. Bromfield Road, Dayton 9, Ohio. Research Finance Committee Chairman, Robert L. Ruleff, 1002 Broadview Boulevard, Dayton 9, Ohio.

DETROIT meets first Friday of each month in Hotel Statler. Secretary-Treasurer, Joseph Gurski, 8885 Littlefield, Detroit 28, Mich. Research Finance Committee Chairman, W. B. Knight, c/o Knight Plating Company, 3143 Bellevue Avenue, Detroit 11, Mich.

GRAND RAPIDS meets second Friday of each month at 7:30 P. M. in Rowe Hotel. Secretary, Keith E. Yhouse, 915 Nayhew-Wood Drive, S. E., Grand Rapids, Mich. Research Finance Committee Chairman, John W. Pulte, 308 Gladstone Avenue, S. E., Grand Rapids, Mich.

HAMILTON BRANCH. Secretary, W. Finlay, 7 Hill Street, Hamilton, Ontario, Canada.

HARTFORD meets third Monday of each month in Hotel Bond. Secretary, Stanley Platoz, 26 Erwin Place, New Britain, Conn. Research Finance Committee Chairman, Frank W. Smith, 46 Cottage Street, Meriden, Conn.

HOUSTON meets fourth Friday of each month at 7:30 P. M. Secretary-Treasurer, J. R. Byerley, Dixie Electroplating Company, 3001 Engelke Street, Houston, Texas.

INDIANAPOLIS meets first Wednesday of each month at Fox Steak House, 1207 Washington Street. Secretary, Edward Bruck, 824 Graham Avenue, Indianapolis 1, Ind.

JACKSON-LANSING meets second Tuesday of each month alternating between Hayes Hotel in Jackson and Porter Hotel in Lansing. Secretary-Treasurer, Fred Stuckenberg, P. O. Box 501, Lansing 2, Mich.

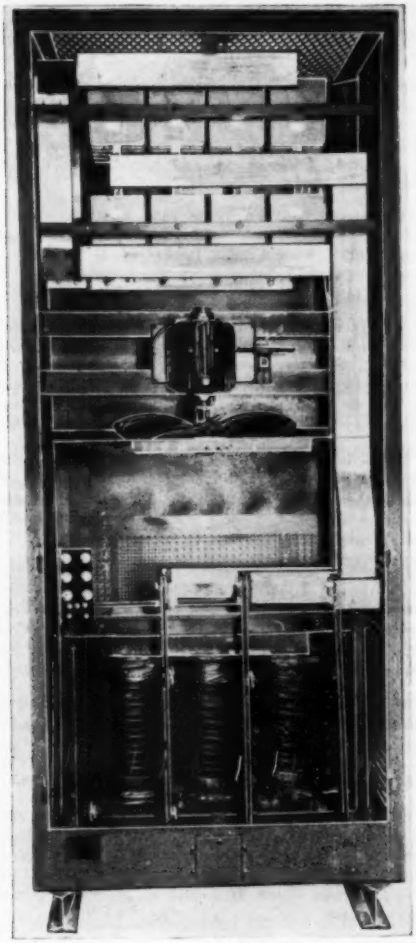
LANCASTER meets second Friday of each month at 8 P. M. in Thaddeus Stevens Industrial School. Secretary-Treasurer, Harry A. Saylor, 40 N. Poplar Street, Elizabethtown, Pa. Research Finance Committee Chairman, Harry Hovis, Lincoln Highway, West Lancaster, Pa.

LOS ANGELES meets second Wednesday of each month at 6:30 P. M. in Rodger Young Auditorium. Secretary, Stuart Krentel, 459 Terrace Street, Altadena, Calif. Research

LEWIS RECTIFIERS

KNOWN FOR

QUALITY and DEPENDABILITY



The Selenium Rectifier
FOR TOUGH PROBLEMS
Both Little and Big

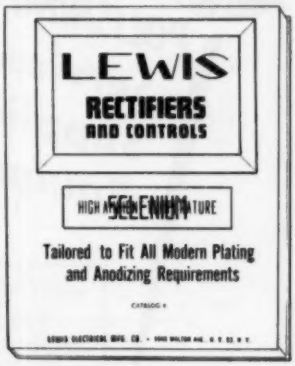
No matter how tough your problem, there's a LEWIS RECTIFIER that will solve it! LEWIS RECTIFIERS are available:

- As Self Contained, Basic or Remote Controlled Units
- In Current Ranges from 10 to 50,000 Amperes
- In most any voltage requirement

For the Following Specific Uses:

Electroplating **Electrotyping** **Anodizing**
Electroforming **Electrocleaning** **Electropolishing**
Barrel Plating **Electrolyzing**
Reverse Current Rectifiers and Controls

For your guide to the best Rectifiers for your individual problem, see the new LEWIS 20-page Catalog, 4th Edition. It's comprehensive . . . covers, in full, with detailed index, Rectifiers for the Electro-Chemical Industries, in models for the laboratory, small shop or mass production shops. In addition, you'll find much useful information on Rectifier Output Wiring Diagrams and Current Carrying Capacities of various sizes of copper bus bar and stranded wire



Send for your copy today!

LEWIS ELECTRICAL MFG. CO.
1943 WALTON AVE. • • • • NEW YORK 53, N. Y.

Star Performers
STEELSHINE
REG. U.S. PAT. OFF.
Rouges
#190 WHITE
#332 BLACK
#14 GRAY
#190 White STEELSHINE produces deluxe mirror-finish without scratches or drag marks.
#332 Black STEELSHINE for first cut down on sisal buff... use on muslin buff to develop final finish.
#14 Gray STEELSHINE to cut down and color carbon steel...even gives surface for subsequent plating.
Standard in finishing
Send for free samples and new bulletins.
E. REED BURNS MANUFACTURING CORP.
40 WITHERS STREET, BROOKLYN 11, NEW YORK
Makers of Green Thread Buffs
Buff Plant
BROOKLYN, NEW YORK
Composition Plant
MIDDLESEX, NEW JERSEY
USE READER SERVICE CARD; INDICATE A 672.

USE READER SERVICE CARD; INDICATE A 673.

Finance Committee Chairman, Jack Beall, 1272 Inverness Drive, Pasadena, Calif.

LOUISVILLE meets third Thursday of each month in Room 119, Speed Scientific Building, University of Louisville. Secretary-Treasurer, J. W. Scholl, Route 2, Georgetown, Ind. Research Finance Committee Chairman, T. K. Allison, 301 W. Main Street, Louisville 2, Ky.

MELBOURNE, AUSTRALIA, meets third Thursday of each month at 8 P. M. in Metallurgy Theatre, Melbourne Technical College, 124 Latrobe Street. Honorary Secretary-Treasurer, Rowland H. Keller, c/o Defence Research Laboratories, Maribyrnong, Victoria, Australia.

MILWAUKEE meets first Friday of each month in Red Arrow Club, 774 N. Broadway. Secretary-Treasurer, E. E. Pieklusch, 2921 S. 90th Street, West Allis 14, Wis. Research Finance Committee Chairman, Phil J. Ritzenthaler, 1928 S. 62nd Street, Milwaukee 14, Wis.

MONTREAL meets first Tuesday of each month in Mount Royal Hotel. Secretary, L. A. Robillard, Canadian General Electric Company, 5781 Notre Dame Street, E., Montreal, P. Q. Canada. Research Finance Committee Chairman, P. M. Coady, c/o Alloycraft, Ltd., 27 Hillside Avenue, Westmount, Montreal 6, P. Q., Canada.

NEWARK meets third Friday of each month at 8 P. M. in Hotel Robert Treat. Secretary-Treasurer, George Wagner, 1130 S. Long Avenue, Hillside, N. J. Research Finance Committee Chairman, Edwin Bowerman, 166-41 17th Avenue, Whitestone, N. Y.

NEW HAVEN meets second Tuesday of each month alternating between Sterling Chemistry Laboratory, Yale University, and Hotel Taft. Secretary-Treasurer, Clark A. Brown, 46 Loller Road, Hamden, Conn. Research Finance Committee Chairman, Dr. H. L. Kellner, c/o Lea Manufacturing Company, 16 Cherry Avenue, Waterbury 86, Conn.

NEW YORK meets second and fourth Fridays of each month in Statler Hotel. Secretary-Treasurer, George Schore, 150 Bennett Avenue, New York 33, N. Y. Research Finance Committee Chairman, George F. Hermann, 52 Chestnut Street, Brooklyn 8, N. Y.

PHILADELPHIA meets fourth Friday of each month in Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Streets. Secretary, I. William Marcovitch, 1434 Lardner Street, Philadelphia 24, Pa. Research Finance Committee Chairman, Robert H. Tiers, c/o Pennsylvania Salt Manufacturing Company, Box 4388, Philadelphia 18, Pa.

PITTSBURGH meets second Thursday of each month in the Avon Room of Sheraton Hotel. Secretary, J. D. Patrick, 817 East End Avenue, Wilkinsburg, Pa. Research Finance Committee Chairman, R. A. Woofter, 42 Hiland Avenue, Emsworth, Pittsburgh 2, Pa.

PROVIDENCE-ATTLEBORO meets third Monday of each month in Providence Engineering Society Hall, 195 Angell Street, Providence, R. I. Secretary, Frank W. Boothroyd, 51 Barber Avenue, Apponaug, R. I. Research Finance Committee Chairman, Pierre B. Lonsbury, 78 North Avenue, Attleboro, Mass.

ROCHESTER meets third Monday of each month at Rochester Institute of Technology. Secretary, Charles B. Fideor, 139 Norton Village Lane, Rochester, N. Y. Research Finance Committee Chairman, Cecil Thornton, 20 Lafayette Parkway, Rochester, N. Y.

ROCKFORD meets second Monday of each month in Faust Hotel. Secretary, Kenneth Kieselburg, 419 Theodore Street, Rockford, Ill. Research Finance Committee Chairman, Al Overbie, c/o National Lock Company, Rockford, Ill.

NEW DU-LITE PRODUCTS FOR METAL FINISHING PROVED IN PRODUCTION

DU-LITE "NP" PAINT STRIPPER

A concentrated liquid for fast stripping of all types of paints, enamels, and lacquers. May be applied to any metal and is especially recommended for stripping coatings on aluminum. Forms emulsion with water and possesses high detergency.

DU-LITE ZINC STRIPPER

For rapid stripping of heavily zinc plated or galvanized finished parts by simple soak operation. Will not etch steel. Ideal for removing dichromate coatings. No undesirable fumes created.

DU-LITE NICKEL & COPPER STRIPPER

A simple soak compound for rapid stripping of nickel and copper deposits from steel. Will not etch or discolor. Because solution is not affected by prolonged soaking of parts, it lasts longer and is less costly to use.

DU-LITE No. 6 BURNISHING COMPOUND FOR BRASS

Especially for the barrel finishing of brass. Also an efficient material for tumbling copper and all ferrous alloys. Reduces tumbling cost because of its fast cleaning and penetrating properties.

DU-LITE No. 8 LIQUID BURNISHING COMPOUND

Especially for barrel finishing of aluminum and zinc. Cleans quickly, efficiently and lustrously, imparting the right degree of lubrication. Also serves as an excellent all-purpose cleaner. Priced to compete with dry compounds.

DU-LITE No. 3 BURNISHING COMPOUND

Especially for the barrel finishing of brass, copper, nickel, chrome plate, stainless steel, and all ferrous alloys, including steel. Reduces tumbling time, producing a bright, uniform lustre. Requires only one rinse in cold water. Economical in use. Priced competitively.

DU-LITE No. 48 CLEANER

New liquid acid cleaner for the rapid removal of metallic oxides, oils, greases, heavy soils, rust, drawing and buffing compounds from all metal surfaces. Combines cleaning, brightening and pickling in one operation. Ideal for surface preparation prior to painting, bonderizing, galvanizing, and electroplating.

LOOK FOR US IN BUFFALO AT THE A.E.S. CONVENTION JULY 30 – AUG. 2

Qualified Du-Lite representatives will be on hand to talk with you about the application of these New Du-Lite Products to your specific problems.

If your problem is Black Finishing, investigate DU-LITE BLACK for all parts of steel. Imparts beautiful, lustrous, rust-resistant black finish by easily controlled, simple process. Meets U. S. Government Specifications for Type III, Class A Finish. Widely used in defense work as a final finish. Makes an ideal substitute for unavailable bright finishes.

THE DU-LITE CHEMICAL CORP.
140 RIVER ROAD
MIDDLETOWN, CONNECTICUT

YOU DO IT RIGHT WHEN YOU USE DU-LITE

Purico Pur-Bur, a new, self-lubricating compound, saves valuable production hours by swiftly removing burrs, surface cracks, gouges, etc., while still giving very close, accurate finishes.

Minute flaws can be disastrous to parts fabricated on a mass production scale. Don't take unnecessary chances. Insist on PUR-BUR for quick, safe, economical removal of surface cracks and gouges before they can elongate and endanger life and material.

PUR-BUR, while acting as a lubricant, also protects the abrasive—lasts longer and is more economical than an ordinary polishing wheel.

PUR-BUR is available in cake and tube form.

Write today for complete information and usage of PUR-BUR.

THE PURITAN MFG. CO.
WATERBURY, CONNECTICUT

SAGINAW VALLEY meets for dinner at 7 P. M. and meeting at 8 P. M. at Zenders, Frankenmuth, Mich., second Wednesday of each month, September through May except February. Secretary-Treasurer, Harlan L. Duley, 5074 School Street, Spartz Creek, Mich. Research Finance Committee Chairman, Alfred Knight, 113 S. Farragut Street, Bay City, Mich.

ST. JOSEPH VALLEY meets first Wednesday of each month at 8 P. M. in Hotel Elkhart, Elkhart, Ind. Secretary-Treasurer, Eugene Roth, 1720 Mishawaka Avenue, South Bend 15, Ind. Research Finance Committee Chairman, J. C. Bayman, 1430 E. Madison Street, South Bend, Ind.

ST. LOUIS meets second Wednesday of each month in York Hotel. Secretary-Treasurer, E. R. Hunleth, 4415 Michigan Avenue, St. Louis, Mo. Research Finance Committee Chairman, H. Siegel, c/o Siegel-Roberts Plating Company, 4193 Manchester Avenue, St. Louis, Mo.

SAN FRANCISCO meets second Thursday of each month, alternating between El Jardin Restaurant, 22 California Street, San Francisco, and El Curtola Restaurant, 510 17th Street, Oakland. Secretary-Treasurer, Roy Fellom, Jr., 709 Mission Street, San Francisco, Calif. Research Finance Committee Chairman, Alan Baker, 10 Bluxome St., San Francisco, Calif.

SOUTHEASTERN meets second Friday of each month in Robert Fulton Hotel, Atlanta, Ga. Secretary-Treasurer and Research Finance Committee Chairman, Dr. Fred W. Cox, Engineering Experiment Station, Georgia School of Technology, Atlanta, Ga.

SPRINGFIELD meets fourth Monday of each month in Hotel Charles. Secretary, Edward F. Koetsch, Jr., 120 Oakwood Drive, Longmeadow 6, Mass. Research Finance Committee Chairman, James Laing, c/o Van Valkenburg Company, Montgomery Street, Williamansett, Mass.

SYDNEY, AUSTRALIA. Secretary-Treasurer, W. W. Paterson, 5 Horbury Street, Sans Souci, Sydney, N. S. W., Australia.

SYRACUSE meets third Monday of each month in Hotel Syracuse. Secretary, Lindley Wood, 1329 Bellevue Avenue, Syracuse 4, N. Y. Research Finance Committee Chairman, George W. Cavanaugh, 129 Kenwood Avenue, Syracuse, N. Y.

TOLEDO meets first Thursday of each month at Commodore Perry Hotel. Secretary, Gaston Bergeman, 703 Pine Street, Fremont, Ohio.

TORONTO meets second Friday of each month in Royal York Hotel. Secretary, R. Stevens, c/o Bryden Brass Company, 927 Dufferin Street, Toronto, Canada. Research Finance Committee Chairman, C. D. Short, 1281 Pape Avenue Toronto, Canada.

TWIN CITY meets first Monday of each month, October through June, in Hotel Curtis, Minneapolis. Secretary-Treasurer, Robert L. Buckley, c/o Industrial Chemical & Equipment Co., 205 11th Avenue So., Minneapolis 15, Minn. Research Finance Committee Chairman, E. H. Lindemann, c/o Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.

WATERBURY meets second Friday of each month in Elton Hotel. Secretary-Treasurer, Spencer L. Henn, P. O. Box, Dr. B, Cheshire, Conn. Research Finance Committee Chairman, Anthony Maz, c/o Risdon Manufacturing Company, Waterbury, Conn.

WESTERN ONTARIO meets third Friday of each month in William Pitt Hotel, Chatham, Ontario. Secretary-Treasurer, K. W. Farquhar, c/o Wallaceburg Brass, Ltd., Wallaceburg, Ontario, Canada.

"STUTZ"

The "Original"

Lucite Ribless

PORTABLE PLATING BARREL

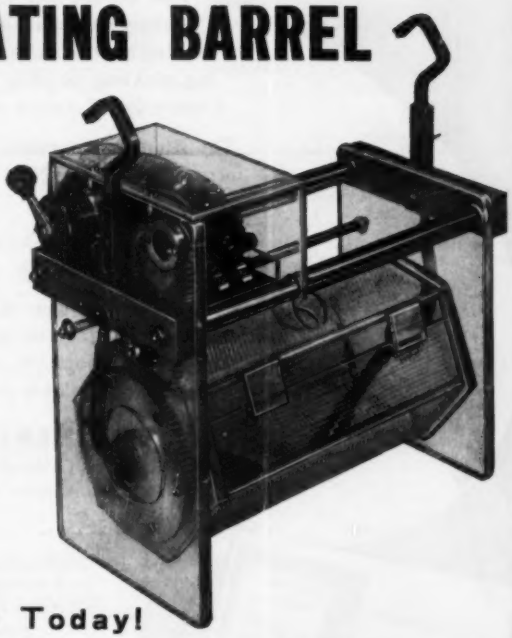
Revolves through the entire plating cycle without transfer of load from one cylinder to another. Maximum solution temperature 185° F. Made in Two Sizes:

6" x 12"..... $203.50
8" x 18"..... $302.50

with reversing switch and plug-in cord and with standard perforations of 3/32" or larger.

Small perforations
$8.00 to $28.00 extra.

As Lucite is non-absorbent, one unit can be used for all your solutions. ORDER TODAY—this is the best investment you can make for your plating room



• • •

Don't Delay—Order Today!

GEORGE A. STUTZ MFG. CO.
PEERLESS PRODUCTS

1645 CARROLL AVENUE CHICAGO 12, ILL.

STUTZ—
Your Guarantee of Quality!

HD-N

Cuts Cleaning Time

Cowles HD-N Cleaner, the *new* heavy-duty soak cleaner for ferrous metals, will often do in 10 minutes what it takes other cleaners 30 minutes or more to do. It is specifically formulated as a straight or barrel soak for precleaning before plating, enameling, pickling, painting, back-shop reconditioning—or anywhere a heavy-duty cleaner is needed to remove stubborn types of soil.

The latest developments in metal cleaning research have been incorporated in HD-N to assure maximum detergency under all conditions of usage.

HD-N may also be used on such active metals as brass and zinc, if some attack is acceptable.

HD-N penetrates and removes such soils as oil, carbon, grease, drawing compound, graphite, road and shop dirt in *one* cleaning operation. It is fast, thorough, and does a complete job . . . is readily and completely soluble in hot water.

COWLES CHEMICAL COMPANY
Metal Cleaner Department
7016 Euclid Avenue • Cleveland 3, Ohio

This booklet will be sent by filling in coupon.

Cowles Chemical Company
7016 Euclid Avenue
Cleveland 3, Ohio

Please send me booklet, "HEAVY DUTY CLEANING THE FAST WAY."

Name_____

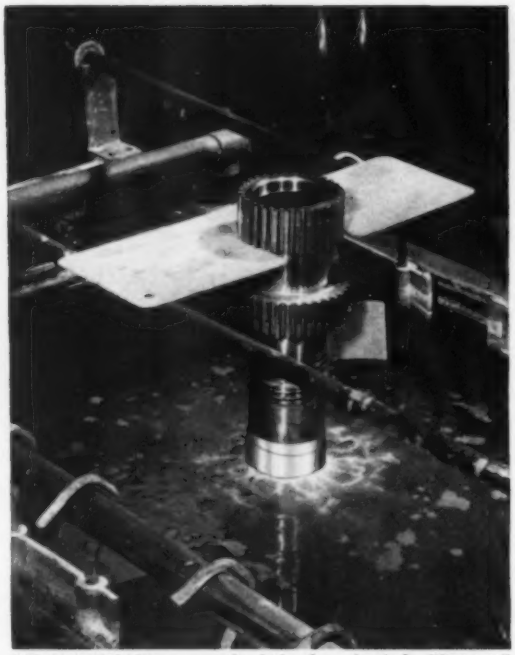
Company_____

Address_____

City_____ Zone____ State_____

Index to Advertisers

ABBOTT BALL CO., THE..... 786
Agency: R. H. Young & Associates
ACME MFG. CO., INC..... 673
Agency: Rex Dye
ALLIED RESEARCH PROD., INC..... 639, 640, 641, 642
Agency: Emery Adv. Co.
ALMCO DIV., QUEEN STOVE WORKS, INC..... 751
Agency: Weston-Barnett, Inc.
ALSOP ENGINEERING CORP.. 750
AMERICAN CHEM. PAINT CO. 648
Agency: May Advertising Co.
AMERICAN ELECTRO-PLATERS' SOCIETY..... 712
AMERICAN RACK CO..... 754
Agency: John Phillips Adv. Co.
AMER. PLATINUM WORKS... 656
Agency: Gallard Adv. Agency, Inc.
ARMOUR & COMPANY..... 664
Agency: Foote, Cone & Belding
ATLAS MINERAL PROD. CO... 760
Agency: Neil Titler Indus. Adv.
AUTOMOTIVE RUBBER CO., INC..... 625
Agency: Burke Bartlett Co., Inc.
BACON FELT COMPANY..... 748
Agency: Sanger-Funnell, Inc.
BAKER & ADAMSON PROD., GEN'L CHEM. DIV., ALLIED CHEM. & DYE CORP. 757
Agency: Atherton & Currier, Inc.
BAKER & COMPANY..... 675
BAKER, M. E., COMPANY..... 676
BART-MESSING CORP.....665, 761
Agency: Bass & Company, Inc.
BEAM-KNODEL COMPANY.... 756
BECKMAN INSTRUMENTS, INC..... 653
Agency: Dozier, Graham Eastman, Adv.
BEHR-MANNING..... 651
Agency: Peterson & Kempner, Inc.
BELKE MFG. COMPANY..... 661
Agency: Allbright Associates
BIAS BUFF & WHEEL CO..... 746
Agency: George Wilfred Wright
BLAKESLEE, G. S., & CO..... 666
Agency: Lauesen & Salomon
BUCKINGHAM PROD. CO..... 776
Agency: Dudgeon, Taylor & Bruske, Inc.
BURNS, E. REED, MFG. CO... 780
Agency: Elwood S. Allen Adv.
CHEMICAL CORP., THE....683, 746
Agency: Wm. B. Remington, Inc.
CHEMSTEEL CONSTRUCTION CO., INC..... 755
Agency: Smith, Taylor & Jenkins, Inc.
CHURCHILL, GEO. R., CO., INC. 750
Agency: Copley Adv. Agency, Inc.
CODMAN, F. L. & J. C., CO.... 705
Agency: Sanderson Brothers
COLUMBIA ELEC. MFG. CO.... 654
Agency: Meermans, Inc.
COWLES CHEM. CO., THE.... 784
Agency: The Bayless-Kerr Co.
CROWN RHEOSTAT & SUPPLY CO..... 667, 747
Agency: Shrout Associates
DANIELS PLATING BARREL & SUPPLY CO..... 674
Agency: Asher, Godfrey & Franklin, Inc.
DARCO DEPT., ATLAS POWDER CO..... 643
Agency: The Aitkin-Kynett Co.
DAVIES SUPPLY & MFG. CO. 745
Agency: Batz-Hodgson-Neuwoehner Adv.
DAY, S. A. MFG. CO., INC..... 758
DETREX CORP..... 672
Agency: Charles M. Gray & Assoc.
DIVERSEY CORP., THE..... 708
Agency: Cruttenden & Eger Adv.
DIXON & RIPPEL, INC..... 762
DUGGAN MASKING DEVICES 768
Agency: James E. Lillis Adv. Agency
DU-LITE CHEM. CORP., THE 781
Agency: Manternach, Inc.
DURIRON COMPANY, INC.... 744
Agency: Kircher, Helton & Collett
EDMONT MFG. CO..... 752
Agency: Mumm, Mullay & Nichols, Inc.
ENTHONE, INC..... 623
Agency: Peck Brothers
EXOLON CO., THE..... 635
Agency: Melvin F. Hall Adv. Agency, Inc.
FORMAX MFG. CO..... 753
Agency: Brindley-Roth, Inc.
FOTHERINGHAM, W. M. CO... 780
GENERAL ELECTRIC CO..... 767
Agency: G. M. Basford Company
GRAV-I-FLO CORP..... 691
Agency: Jones & Taylor & Assoc.
W. GREEN ELEC. CO., INC..706–707
Agency: Shappe-Wilkes, Inc.
GUMM, FREDERICK, CHEMICAL CO., INC.....2nd Cover
HANDY & HARMAN..... 637
Agency: Peterson & Kempner, Inc.
HANSON-VAN WINKLE-MUNNING COMPANY..655, 4th Cover
Agency: O. S. Tyson & Co., Inc.
HARRISON & CO., INC..... 766
HARSHAW CHEM. CO., THE.. 694
HAVEG CORPORATION..... 659
Agency: Beaumont, Heller & Sperling, Inc.
HEIL PROCESS EQUIP. CORP. 652
Agency: The Lee Donnelley Co.
HENDERSON BROS. CO., THE 638
Agency: The Taylor & Greenough Co.
HOLLAND, J., & SONS, INC.... 633
Agency: N. D. Waters & Assoc., Inc.
HULL, R. O., CO., INC..... 671
Agency: Ralph M. French Asv.
INDUSTRIAL FILTER & PUMP MFG. CO..... 658
Agency: The Advertising Corp.
INDUSTRIAL PROD. CO..... 752
Agency: The Stewart-Jordan Co.
INTERNATIONAL NICKEL CO. 669
Agency: Marschalk & Pratt Co.
KEYSTONE POWER PLANT EQUIPMENT CO..... 759
KNIGHT, MAURICE A..... 777
Agency: Brown Adv. Agency
KNIGHT PLATING CO..... 678
KOCOUR COMPANY..... 763
Agency: DeCasseres & Associates
KUSHNER, JOSEPH B..... 746
LAND, L. J., INC..... 762
LASALCO, INC..... 720
Agency: Charles W. Bolan, Adv.
LEA MANUFACTURING CO... 719
Agency: Sanger-Funnell, Inc.
LEWIS ELEC. MFG. CO..... 779
Agency: Irwin Wayburn & Co.
L'HOMMEDIEU, CHAS. F., & SONS CO..... 624
LINCOLN INDUSTRIES, INC... 754
MAAS & WALDSTEIN CO..... 743
Agency: The Franklin Fader Co.
MAC DERMID, INC...788, 3rd Cover
Agency: Chambers & Wiswell
MAGNUS CHEMICAL CO..... 660
Agency: Spooner & Kriegel
MAGNUSON PROD. CORP..... 773
Agency: George Wilfred Wright
MANUFACTURERS PROC. CO. 628
Agency: Advisers, Inc.
MATCHLESS METAL POLISH COMPANY..... 668
Agency: Almon, Brooks, Wilder, Inc.
MEAKER COMPANY, THE..... 749
Agency: The Adv. Corp.
MICHIGAN BUFF CO..... 756
MICHIGAN CHROME & CHEM. COMPANY..... 645
MILLER, J. C., CO..... 677
Agency: James Philip Read Adv. Agency
MILLER PROD. CO., INC..... 755
Agency: Battistone, Bruce & Doniger, Inc.
MINNESOTA MINING & MFG. COMPANY..... 786
Agency: Batten, Barton, Durstine & Osborn, Inc.
MITCHELL-BRADFORD CHEMICAL COMPANY..... 650
Agency: Claude Schaffner Adv. Agency
MUTUAL CHEMICAL CO. OF AMERICA..... 630
Agency: The House of J. Hayden Twiss
NELSON CHEMICALS CORP. 769
NEW ENGLAND BUFF CO..... 630
NEW JERSEY METALS CO..... 760
Agency: Gallard Advertising Agency
NEW HOLLAND MACHINE CO. 646
Agency: J. Walter Thompson Co.
NOBLES ENGR. & MFG. CO... 690
NORTHWEST CHEM. CO..... 679
Agency: Hyatt Eby Advertising
NORTON COMPANY..... 647
Agency: James Thomas Chirurg Co.
OAKITE PRODUCTS, INC..... 763
Agency: Rickard & Co., Inc.
WM. PARKER COMPANY..... 680
Agency: The Advertising House
PENNA. SALT MFG. CO.....688-689
Agency: Geere-Marston, Inc.
PESCO PLATING EQUIP. CORP., 650
PHELPS DODGE REFIN. CORP. 755
Agency: Atherton & Currier, Inc.
PHILADELPHIA QUARTZ CO.. 636
Agency: Michener & Holland
PLATERS RESEARCH CORP... 762
Agency: Slate Advertising Service
PLATERS SUPPLY CO..... 682
POWERS REGULATOR CO..... 787
Agency: Symonds, McKenzie & Co.
PROMAT DIV., POOR & CO. 662-663
Agency: Russell T. Gray, Inc.
PURITAN MFG. CO..... 782
Agency: Post, Johnson & Livingston, Inc.
QUINN, NELSON J., CO..... 634
Agency: Wendt Adv. Agency
RAPID ELECTRIC CO..... 730
Agency: Bertram Coren Adv.
RICHARDSON-ALLEN CORP... 644
Agency: Claude Schaffner Adv. Agency
ROBERTS ROUGE CO..... 638
Agency: Ted Sommers, Inc.
ROCKWELL LIME CO..... 748
ROTO-FINISH COMPANY..... 632
Agency: The Jaqua Co. Adv.
SARAN LINED PIPE CO..... 685
Agency: MacManus, John & Adams, Inc.
SARCO COMPANY, INC..... 628
Agency: Gus Binz Assoc.
SCHAFFNER MFG. CO., INC... 643
SCHORI PROCESS DIV., FERRO-CO..... 787
Agency: Harry Hurst Adv.
SEELEY, E. E., CO., INC..... 762
SETHCO, THE WEXTON CO.. 759
SEYMOUR MFG. CO., THE... 649
Agency: Claude Schaffner Adv. Agency
SPARKLER MFG. CO..... 670
Agency: Kreicker & Meloan, Inc.
STANDARD PLAT. RACK CO.. 629
Agency: Allen Adv. Agency
STEVENS, FREDERIC B., INC. 692
Agency: Grant Advertising, Inc.
STORTS WELDING CO., INC... 636
STUTZ, GEORGE A., CO..... 783
Agency: Sander Rodkin Adv. Agency
SULPHUR PROD. CO., INC.... 754
TEXTILE BUFF & WHEEL CO. 687
Agency: Elwood S. Allen
THERMAL SYND., LTD., THE 759
Agency: Asher, Godfrey & Franklin, Inc.
TITEFLEX, INCORPORATED.. 680
Agency: Robert L. Marloff, Inc.
TRAMER, GILBERT, CO., THE. 684
Agency: Claude Schaffner Adv. Agency
TRUE BRITE CHEM. PROD. COMPANY..... 652
UDYLITE CORP., THE..... 631
Agency: Grant Advertising, Inc.
UNITED BUFF PROD. CORP. 760
Agency: Gallard Adv. Agency, Inc.
UNITED CHROMIUM INC.. 654, 686
Agency: Rickard and Co., Inc.
U. S. STONEWARE CO..... 627
Agency: Ralph Gross Adv., Inc.
WAGNER BROS., INC.....681, 758
Agency: Fred P. Bingham, Tech. Adv.
WILLIAMSVILLE BUFF DIV., THE BULLARD CLARK CO. 657
Agency: Gordon Schonfarber & Assoc., Inc.
WYANDOTTE CHEM. CORP... 626
Agency: N. W. Ayer & Son, Inc.
ZIALITE CORPORATION..... 758



HOT CAUSTIC BATH removes tin plating from the shaft. "SCOTCH" Pressure-Sensitive Tape No. 470 masks off parts which must be protected from destructive action of the caustic.

Tough plastic tape stops hot, tin-eating caustic!

At Northwest Airlines, tin plating is removed from engine impeller shafts prior to reconditioning and replating. Here's how "SCOTCH" Pressure-Sensitive Tape No. 470 makes the job easier and faster.

Plastic backing of this tape conforms snugly to odd-shaped and irregular surfaces, withstands both caustics and acids. Cleaning and plating solutions can't creep under tape's strong adhesive. Result: clean, sharp jobs every time. And "SCOTCH" Pressure-Sensitive Tape No. 470 is easy to apply, too. It needs no special application or removal equipment, no skilled labor.

Let us show you how this unique plating tape can save you money. We'll be glad to have a sales engineer call. Just write Dept. P-7 for further details.

The term "SCOTCH" and the plaid design are registered trade-marks for the more than 100 pressure-sensitive adhesive tapes made in U. S. A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn. . . . also makers of "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives.

General Export: Minn. Mining & Mfg. Co., International Division, 270 Park Avenue, New York 17, N.Y., In Canada: Canadian Minnesota Mining & Mfg. Co., London, Canada.

Future Meetings

DETROIT BRANCH, A. E. S., Annual Stag Day on July 21 at Forest Lake Country Club.

AMERICAN ELECTROPLATERS' SOCIETY Annual Convention in Hotel Statler, Buffalo, N. Y., on July 30-August 2.

AMERICAN CHEMICAL SOCIETY Diamond Jubilee Meeting in New York City on September 3–7.

6TH ANNUAL INSTRUMENT CONFERENCE AND EXHIBIT, sponsored by the Instrument Society of America, in Sam Houston Coliseum, Houston, Texas, on September 10–14.

THE ELECTROCHEMICAL SOCIETY Fall Conference in Statler Hotel, Detroit, Mich., on October 10–13.

3RD ANNUAL METAL SHOW at Michigan State Fair Grounds, Detroit, Mich., on October 15–19.

NEW FACTS & IDEAS

on
bearing balls
•
burnishing materials
•
barrel finishing

Send for your copy . . . today! No obligation

THE ABBOTT BALL COMPANY
1054 New Britain Ave., Hartford 10, Conn. U.S.A.

Schorithene

FLAME-SPRAYED CORROSION-RESISTANT POLYETHYLENE-LINED DRUMS

Better - Yet Costs Less!

Seamless *Standard*

Platers are enthusiastic about these new corrosion-resistant drums for operations where they formerly used breakable glassware and crocks . . . dipping, storing, plating, filtering, etc. . . . for practically any chemical used in the plant!

Schorithene is a seamless plastic lining made of polyethylene powder with the patented Schori Flame-Spray Pistol . . . the most corrosion-resistant material available today. Bonds firmly to metals, assuring long life; easy to clean. Drums coated on outside with plastic paint as protection against splash and drip.

Order Schorithene-lined drums directly from us or your distributor. See price list. Prices F.O.B. Long Island City; orders accepted from rated companies, otherwise payment with order. No COD's.

PRICE LIST

Gallon Cap.	Inside Diam.	Inside Height	List Cost
3½	11″	9″	$7.50
5	11″	12″	9.50
8	14″	13″	12.50
15	15″	20″	17.50
20	16″	24″	24.50
20	18″	20″	24.50
30	18″	27″	29.50
30	22″	20″	29.50
35	21″	24″	30.50
55	22″	34″	36.50

Custom Spraying of Tanks, Pumps, Agitators, etc.
Distributor Territories Open

SCHORI PROCESS DIVISION

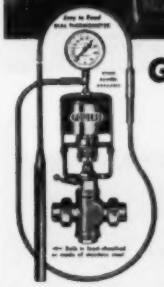
FERRO-CO CORPORATION

VERNON BLVD. AND 43rd ROAD
LONG ISLAND CITY 1, N. Y.

USE READER SERVICE CARD: INDICATE A 680.

In PLATING, CLEANING and RINSE TANKS, ANODIZING, OXIDIZING, PICKLING and DEGREASING TANKS

Below: Official U. S. Navy Photograph Michelson Laboratory Naval Ordnance Test Station Inyokern, Cal.

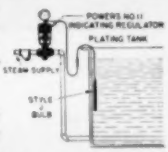


Get BETTER Control
SAVE LABOR
Reduce Costs with—

POWERS

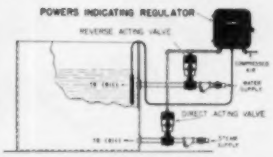
No. 11 TEMPERATURE REGULATORS

Most of the more than 30 steam heated tanks used in the Navy's modern shops shown above are automatically controlled by Powers regulators. They maintain a constant temperature, end losses caused by OVER-heating, help reduce rough plating, buffing time and decomposition of plating solutions.



Easy to Install—self-operating, have an easy to read 4″ dial thermometer which shows temperature of plating solution under control. They are available with either lead sheathed or stainless steel bulbs. Bulletin 329 gives full information.

Compressed Air Operated Indicating Regulator



POWERS Series 100 Regulator

Accurately Controls heating and cooling of plating solutions

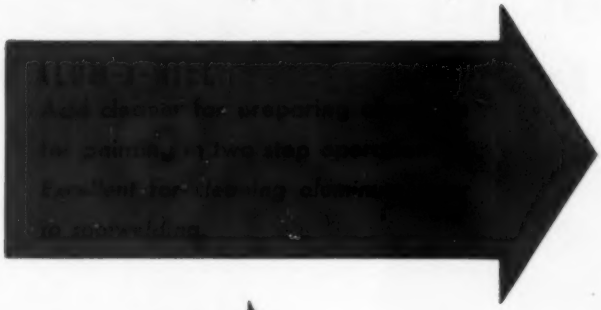
Powers has the most complete line of temperature regulators made **for metal finishing operations. Contact our nearest office for further information, or**

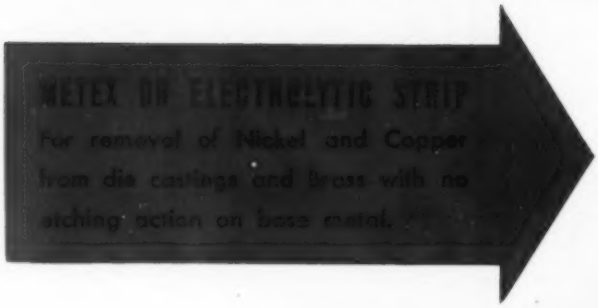
Write for Circular PLN

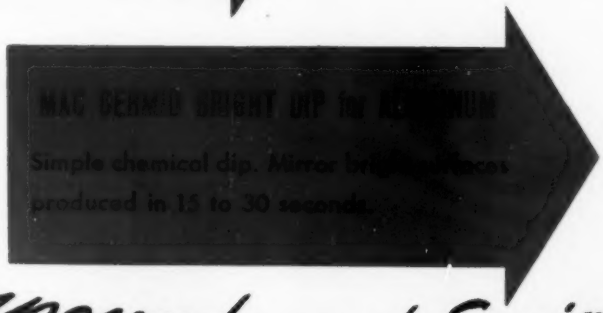
THE POWERS REGULATOR COMPANY

2779 Greenview Avenue, Chicago 14, Illinois (PLO)
Established 1891 • Offices Over 50 Cities • See Your Phone Book

USE READER SERVICE CARD: INDICATE A 681.




METEX DR ELECTROLYTIC STRIP
For removal of Nickel and Copper from die castings and Brass with no etching action on base metal.



Compounds and Equipment

INDICATE A 682.

WRITE FOR THESE TECHNICAL DATA SHEETS:

#1 Metex Zinc Stripper
#2 Dyclene E for Die casting
#3 Anodex 61X for buffed copper
#4 Anodex for steel
#5 Rochelex for copper plating
#6 Chrome Resistex — cleaner
#7 Pressure Spray Cleaners
#8 Chromatex — nickel [illegible]
#9 Metex Acid Additive
#11 Metex Durafex
#12 Metex Plastic Stripper
#13 Alumadex Process
#14 Tranzide — Dry acid salts
#15 Blackmax
#16 Nickelex Stripper
#17 Chemefome — Wetting agent
#18 Alum-i-Nickel Acid Cleaner
#19 Zinclex Addition Agent
#20 Metex DS — Acid strip

FOR PLATING ZINC USE

ZINCTEX

- Increases cathode efficiencies.
- Reduces cyanide consumption.
- Makes all brightness more effective.
- Zinc deposit is more uniform.
- Zinc deposit takes chromate bright dips with more uniformity.
- Reduces zinc metal buildup in solution when current is off.
- Increases amount of zinc metal deposited in recesses.
- Zinc bath can vary over wider range with ZINCTEX addition.

• ZINCTEX is a liquid addition agent for zinc plating. A companion product of ROCHELTEX for copper plating.

for Metal Finishing

WRITE FOR TECHNICAL DATA SHEET #19.

MAC DERMID
Incorporated
WATERBURY 20, CONNECTICUT

PLATEMANSHIP

H-VW-M's unique combination of:

. . . the most modern and complete laboratory for testing and development

. . . ability to provide complete equipment and materials for every plating and polishing need

. . . the complete background of knowledge and experience in every aspect of plating and polishing.

ONLY H·VW·M PLATEMANSHIP brings you the advantages of STAPLBOND BRUSH CONSTRUCTION...

As specialists in meeting and anticipating the needs of the electroplating and polishing industry, H-VW-M can always be relied upon to supply the *right* brush for every job. Two all-inclusive lines are available . . .

StapLbond Tampico Brushes for the widest possible flexibility of application in metal cleaning and polishing. The use of *Acme* Emery Paste or Cake with them is recommended for polishing irregular steel surfaces; pumice or special compounds for producing a satin finish; cleaning solutions for brush cleaning all metals.

StapLbond Steel Wire Brushes for heavy brushing, cleaning, etc., on rubber, castings, gear teeth and for removing scale, rust and paint from metal surfaces.

H-VW-M supplies a complete line of brushes to meet all requirements—brushes which embody all the refinements of *Platemanship*—are designed for long, fully dependable service regardless of the task to which they are put. Detailed reasons why they are preferred are found in Bulletin BR-104. Send for it.

. . . that provides rigid, strong, fibrous centers which combine economy with efficiency and durability

. . . that evenly distributes tampico fibre or wire around the hub and securely anchors it in position with a steel ring.

. . . that concentrically trims each section to insure perfect balance

. . . that enables H-VW-M to supply brushes that are exactly right for the service for which they are intended —brushes that turn in a consistently dependable performance over a longer period of time.

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, NEW JERSEY

PLANTS AT: MATAWAN, N. J. • ANDERSON, INDIANA • SALES OFFICES: ANDERSON • BOSTON • CHICAGO CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • MATAWAN • MILWAUKEE • NEW HAVEN NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) • UTICA

H·VW·M

8133

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

FOR FURTHER INFORMATION, USE READER SERVICE CARD: INDICATE A 683.